

ENVIRONMENTAL INFORMATION AND COGNITIVE NEEDS

BY

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A B S T R A C T

This thesis is concerned with the study of the cognitive experience of man-made environment and its implications on design. It is based on the exploration of the richness of the potential informational content of man-made environment. This content is stored in it in the process of its shaping in the form of representations of social relations. Cognitive experience of man-made environment is related to the development of the individual's mental world in view of his cognitive needs. When man is seen as a person in his own right, his cognitive needs may be regarded as potentially transcending the scope of the activity he is engaged in at the time, so as to refer to any social relation in the environment. It is suggested that, apart from supporting the human activities it contains, man-made environment is of notable significance to man for another reason: it constitutes a major domain for experience which is complementary to his overall experience of the world. All environmental objects can be seen as taking part in this function.

In as much as the users' cognitive experience is concerned, the designer is required to approach the design problem in two ways: firstly, in relation to the activity contained and, secondly by placing the emphasis on the users, in relation to their deeper psychological and cognitive needs. The discussion in the first part of the study provides a picture of the social relations which may become represented on the end product to meet the requirements of the second approach. The designer is further required to acquire a deep understanding of the significance of cognitive experience of man-made environment to man, the parameters and variables involved, the means to ensure the smooth and efficient transmission of meaning and so on. Above all, as his role in society may be considered as broadened, he is required to understand that his responsibility is also increased.

I N T R O D U C T I O N

0.1 THE REASONS WHICH INITIATED THIS STUDY

It is a sad fact that the condition of our cities is continuously deteriorating while their image is becoming increasingly fragmented. This is particularly so if one observes change in certain parts of the city and especially inner city areas and the districts where the low-income groups live. Writers such as Jane Jacobs, Theo Crosby and Robert Goodman have described this convincingly nearly two decades ago.

Mainly because of this fact and partly because of the natural evolution in society's priorities, researchers and theorists have approached the man-environment relationship vigorously in recent years. Writers, like Constance Perrin, pointed at the multi-disciplinary nature of environmental issues and placed an additional emphasis on man, the user. A new field of studies, most commonly called Man-Environment Studies, has emerged; its main point of concern is centered on the systematic study of the mutual interaction of people and their built environment. According to Rapoport, the discussion and research on the field has been centered around three major issues: the way people shape their environments, the way they are, in turn, affected by them and the mechanisms through which this link is expressed. (Rapoport, 1977, pp. 1-7).

The discussion so far has suggested that, apart from being

functional in the conventional sense, man-made environment may have to satisfy additional requirements. In as much as its image is concerned, one may argue that contemporary designers are now becoming increasingly aware that the environment can be seen as a form of non-verbal communication. It seems reasonable to suppose that the growing interest in the human aspects of the man-environment relationship has enhanced designers' perceptiveness over the social implications of what they design.

Yet, it appears that research on the field and its major areas of concern is still in the process of its shaping. One arrives at this suggestion from the simple fact that, although the issues are currently being widely discussed, new developments in design practice do not seem to have been influenced significantly, apart from a few notable exceptions. This may be attributed to several reasons. Firstly, in epistemological terms, it is arguable whether theoretical and empirical advances on the field have been capable of initiating the novel overall views (or "paradigms", to put it in Kuhn's, 1970, words) which are needed to change the designers' conception of the problem in a revolutionary manner.

The fact that the man-environment relationship typically involves many disciplines is clearly a constraint to this end. Although research is basically concerned with the human aspects of the issue in question, there does not seem to be any prevailing theory referring to what man requires

from his environment as yet. Several holistic approaches that have been attempted (e.g. Norberg-Schulz's) did not prove to be eligible of serving as the basis for the discussion. As a result, the latter remains to a considerable degree fragmented while the requirements it sets on design tend to be sporadically identified.

Secondly, the context in which designers operate is not particularly helpful in providing the grounds for the majority of them to be actively involved in the discussion. The harsh facts of the reality of everyday life, in relation to the economic priorities set, do not allow the luxury of such theoretical wanderings. This is further prohibited by the lack of a clearly defined conceptual framework and the growing specialization that characterizes research on the field. Apart from being incapable of influencing design practice significantly, the discussion does not receive the feedback it needs and entails the danger of becoming increasingly elitist.

The third reason is to be sought in the prevailing approaches to the problem and their reflection on contemporary design theories. A notable number of such theories are basically concerned with a particular range of human needs which are to be satisfied by the built environment. In as much as man's cognitive experience of his surroundings is concerned, these needs usually relate to foreseeable action. For example, as a direct effect of a sign of communication (as it is often apparent in the writings of semiologists), or in relation to way-finding (as it is implied in the work

of Kevin Lynch and subsequent studies in the image of cities) or, finally, as forming the basis for choosing between different environments (as this has been extensively analyzed by Rapoport).

The bias towards overt behaviour must surely be accounted with the long tradition of behaviourist thinking, according to which, to put it in Laing's (1965, p. 20) words, people tend to be regarded as organisms merely responding to external stimuli rather than persons in their own right. Man, then, tends to be seen as receiving the information needed for his mere operational needs in view of his goal-oriented behaviour. One could perhaps argue that even the findings of the cognitive approaches in psychology are often being incorporated to the direction of explaining how people behave in their physical settings rather than what the experience of their surroundings means to them.

It appears reasonable to suggest that this attitude is liable to lead to an approach in which the environment is viewed in as much as it merely facilitates the activities it contains. As few design theorists (like, for example, Norberg-Schulz) have a holistic conception of human needs as their point of departure, it may be expected that, on the whole, designers are asked to put little weight on the universal psychological needs of man as a person. In this sense, the role - indeed, the significance - of man-made environment for man may be, somehow, misconceived.

0.2 AIMS AND LIMITATIONS OF THE STUDY

The present work is dedicated to the study of cognitive experience of man-made environment and its implications on design. The aim is to explore the richness of the environment's potential informational content and the varieties of cognitive experience in view of man's cognitive needs. Based on the relation between cognition and the development of the person's mental world, it will be attempted to reassess the significance of the cognitive experience of man-made environment to man.

The discussion in the preceeding section poses three additional families of criteria that this study has to meet. Examining them in reverse order, it is firstly important to view cognition in relation to the qualities of the individual when seen as a person in his own right. In this sense, cognitive activity is to be approached in as much as it refers not only to man's goal-oriented behaviour but also to his deeper psychological needs. On the other hand, the impact of such activity is to be related to the most dispositional characteristics of man's inner structures. Secondly, it is important for this study to come to clear conclusions both as regards the development of its theoretical considerations and their implications on design theory and practice. In view of the limitations of the context in which designers operate, clarity appears to be a necessary prerequisite. The confinement of the scope of the study to that of cognitive, rather than aesthetic or holistic, experience of the environment is expected to help

in this direction.

The area of concern is narrowed down to one particular channel through which man relates to his surroundings.

It has been noted earlier that designers are becoming increasingly perceptive of the social implications of their designs. Yet, it can be argued that this perceptiveness may be often considered as random, unstructured or superficial. It is essential to provide them with the means to acquire a deeper and more accurate knowledge over the impact of the image of their designs.

Finally, this study is based on the assumption that in a time of crisis in theory (to use Kuhn's term) it is important to re-organize and increase the knowledge of the confused subject rather than to search for mere blueprints and guidelines to be applied indiscriminately. It is hoped that the theoretical considerations elaborated in this study and the way they are applied to design will be a further step to the understanding of the issue in question.

At this point it is essential to note that there are several conceptual limitations imposed by the lack of universal agreement over the question of how man acquires his knowledge of the world. Eighteenth century empiricist philosophers, like Locke and Hume, assumed that at birth the mind is in a blank slate condition and that knowledge of reality is built up from successions of sensations imposed upon it. On the other hand, rationalism (advocated by philosophers such as Leibnitz and Descartes) starts from

the opposite contention that knowledge is given immediately, as an innate idea, before experience (see Bochenski, 1966). Contemporary developments in science and epistemology have suggested that the issue is more of a question of degrees to which experience preceeds knowledge rather than absolute truths. Philosophers like Kant, who differentiated between the "form" and "matter" of knowledge, have contributed to this direction by providing the ground for more interactive positions to be taken (see Moore and Colledge, 1976, pp. 13-16).

Yet, the argument is still alive, particularly so in an extremely controversial discipline like psychology. For example, a researcher who is leaning towards empiricism will tend to view external and visible stimuli as more fundamental than what is internal and not directly observable.

The present study, as perhaps all research on the human condition, can not claim to be impartial to the above argument. Its area of concern, however, covers both the way potential information is stored in the environment in the process of its shaping and the way this information is integrated within man's mental world; that is, both an external and an internal condition. To the extent that both opposing attitudes give a fair explanation of different aspects of reality to some considerable degree (see, for example, Arndt, 1974), it is essential that this study does not exclude any of them from being taken into consideration. In this sense, the development of argument in this thesis should basically concentrate on the issues in question and then refer to the

way each philosophical position affects the discussion.

As it will be noted in the second part of this study, the nature of the cognitive experience of man-made environment is particularly restrictive in adducing empirical evidence as to the degree of inference involved. Because of this and in relation to what has been discussed above, it is clear that it is not possible to come to a firm conclusion with regard to the question of which part of the environment's potential informational content is experienced. In this sense, this study may only be exploratory in nature, as its basic conclusions are essentially suggestive.

0.3 THE STRUCTURE OF THE STUDY

The first part forms the background knowledge needed for the development of the argument. This knowledge is to be attained through the exploration of the potential informational content which is stored in man-made environment in the process of its shaping. Based on analytical observation, the aim is to see whether it is possible to arrive at a formulation which will provide an adequate explanation for the variety in forms. Differentiation in form is, firstly, attempted to be explained in view of the composite need for change and then (more successfully) in view of the social relations which are involved in the production of environment.

Man-made environment is, finally, seen as embodying a wide and deep array of representations (or, objectifications, to use the term of phenomenologists Berger and Luckman, 1967) of social relations which may potentially function as signifieds to differentiation in form.

The approach in the second part of the study is necessarily ego-centered since it focuses on the cognitive experience of man-made environment in view of man's cognitive needs.

An overview of the literature in psychology suggests that man's cognitive needs are not necessarily instrumental (operational) in nature. They may also be more closely related to man's basic needs and, hence, transcend the scope of goal-oriented behaviour. It is then suggested that these cognitive needs may be held responsible for giving man the tendency to experience the fuller dimensions of the environment's potential informational content.

Piaget's concepts of assimilation and accomodation of cognitive experience provide an explanation for the way in which individual cognitions affect, modify or alter cognitive structures and the person's mental world as a whole. After examining the factors which affect the formation of collective images, it is concluded that man-made environment may be regarded as an important domain for experience which is complementary to man's overall experience of the world.

The last part of the study constitutes an attempt to apply what has been discussed so far to design theory and practice. Firstly, the theoretical considerations of this study are brought in relation to urban design theories which are similar in scope.

The second section, which is pertinent to design practice, points that the users' cognitive activity does not only refer to their operational needs. It is suggested however, that a notable number of contemporary architects and designers are basically concerned with this aspect of cognition. Yet, as man-made environment can be regarded as an important domain through which man attains his experience of the world, all environmental objects can be seen as functioning in this direction. This leads to specific requirements as regards the objectivation of social relations involved in the production of environment, as this has been analyzed in the first part of this study. In as much as the cognitive experience of man-made environment is concerned, design problems are to be approached by focusing both on the activities involved and the users' deeper needs.

The designer is further required to come to a deep understanding of the significance of cognitive experience of man-made environment to man and the parameters and variables involved and the implications they entail. What is also needed is an awareness of the social relations involved in a particular production of environment, the configuration of the users' personal parameters in respect to this and the way in which social relations may become represented on the end product so that meaning may be transmitted smoothly and efficiently. Clarity and complexity in the environment can be seen as functioning in this direction.

As the designer's role in society is clearly broadened, it is inevitably paired with increasing responsibilities. It appears that the deeper understanding needed may only be acquired through the designers' increased education.

PART ONE

THE PRODUCTION OF MAN-MADE ENVIRONMENT AND THE RICHNESS OF ITS POTENTIAL SIGNIFICATION

1.0 INTRODUCTION

One of the main aims of this study is to explore the importance of man-made environment as a domain for cognitive experience and, as such, contributing to man's intellectual development. The first state in examining this function is the analysis of the origins of environmental stimuli which, when perceived, may serve as cues for social inference. As this study aims at establishing a link between potential information in man-made environment and man's mental world in the widest dimensions of the cognitive structures it contains, the potential informational content of environmental forms is to be explored in all its richness. To achieve this it appears essential to examine the way in which they are stored in the environment in the process of its shaping.

Searching for an approach which will provide the foundations for an inquiry on the question posed there are some criteria that have to be met and which stem from the nature of the problem. Firstly, as noted above, the approach taken should consider the potential informational content of man-made environment in such a way that its richness is retained. Secondly, it should provide some theoretical construct which would, on the one hand, give a good picture of this content, and, on the other hand, it should be flexible enough to be applied for different cases and in different conditions of the production of environmental forms. The reason behind this second criterion is that, not only is it needed to come to a conception of the content in all its richness, but it may also

be required by designers to come to such a conception before their designs are put into shape. This latter point will be discussed at a later stage in this study.

Let us now consider the approaches to the problem. One may identify several of them and these originate from different disciplines. An approach which seems to be of substantial relevance is the one of architectural and urban semiologists who aim to describe the environment in terms of its power to operate as a system of signs. Developing models largely out of natural language studies, the object of these researches is to show how the physical environment can express social meanings in the same way as natural language. (Broadbent, 1977; Jencks, 1969, 1980, 1981; Eco, 1980). By doing so, they identify a substantial amount of information embodied on artefacts which, according to natural language rules and codes, can be structured in an orderly manner.

Yet, there are two reasons to explain why this body of work, relevant as it may be to the present context, can not serve as the starting point for the study. The first reason refers to a recent controversy developing amongst semiologists in regard to the analogy between natural language and the language of the environment. Several theorists appear to be taking this analogy for granted while others are much more sceptical. Based on the thesis that between material and linguistic artefacts there exists a constitutive homology originating from their common genetic root in production - as this has been formulated by Italian semiologists Prieto

and Rossi-Landi - Krampen suggests that the relation of direct analogy between the two sign systems is not to be easily assumed. It appears that there is no evidence to sustain the hypothesis that "since all languages are made up of words and all words are signs, all things made up of signs are languages" (Krampen, 1979, pp. 34-36). Krampen's argument appears to be shaking the efficiency, if not the validity, of semiotic analysis as it asks for additional requirements to be taken into account. And, as these requirements remain ill-defined as yet, there seems to be new ground opening for research on semiological issues. In relation to the present study however, the above argument appears to imply the need to go into the examination of how the potential informational content of man-made environment originates from the "genetic root of its production" rather than employ ready-made models of natural language.

The second reason is related to the above, as it refers to the origins of the sign. When Morris modified Piercian semiotics, he identified three fields of study which semiotics had to cover: "semantics", that is the study of the sign in relation to what it stands for, "syntactics", the study of the structural relations between more than one signs, and "pragmatics", the study of the origins, the uses and the effects of signs (Morris, 1946, p. 217). The development of semiotics however, has tended to concentrate on the first two branches and it appears reasonable to argue

that this tendency - on which Krampen's argument throws some light in as much as the origins of the sign are concerned - has affected both the findings as such, as well as the whole nature of semiotics as a methodological discipline. When an artefact is seen in isolation of its origins and use, the informational content that can be identified on it is substantially less than what the complexities of real life situations have stored in it as potential meaning. This loss could have been crucial for a study such as the present one which focuses on the cognitive needs of the individual and should rely on methods that would identify the widest body of potential information in man-made environment. A semiotic analysis, therefore, would not cover the problem.

Nevertheless, as semiotics evolved into the study of the systematics of appearance (by concentrating on semantics and syntactics), a notable analysis of the characteristics of the sign has been developed. Concepts and distinctions from this research are extremely helpful in clarifying and elucidating a number of aspects relating to the communicative qualities of man-made environment. In this sense, it is essential for this study to relate to semiotics, especially once the potential informational content of man-made environment has been explored, so that the continuity between the sign and its origins is retained.

A second line of approach which has several links with the problem examined in this part of the study is the study of the evolution of environmental forms, and as such research has largely

concentrated on two "objects" of study, the history of art and architecture. Until the beginning of the twentieth century, the history and interpretation of art and architecture was basically concerned with analyzing the formative aspects of what had been produced and deserved appraisal. Later, the level of discourse became more scientific as it was heavily influenced by the Hegelian idea of "Zeitgeist". According to this notion, every civilization is characterized by its peculiar and distinctive spirit, its "Zeitgeist". Since all phenomena should always be viewed within their living (actual) cultural and social context and never in isolation, the same principle must be applied when interpreting human products, such as masterpieces of art and architecture. Porphyrios argues that this notion has been prevalent in the approach of historians even until the present day (Porphyrios, 1981, p. 96).

Once historians pass the threshold of being concerned with the purely physical aspects of forms (as f.i., Fletcher, 1961), they are interested in discovering analogical similarities between the social framework and the artefacts they describe and their studies may definitely be of substantial relevance in the present context. These studies however, can not serve as offering the foundation on which this study can be based since such identified analogical similarities generally refer to the specific forms which are being analyzed. Even when they transcend the scope of the particular form, going

from the individual to the generic, theoretical formulations tend to be very general in character. In "Space, Time and Architecture", Giedion wrote: "We are looking for the reflexion in architecture of the progress our own period has made towards consciousness of itself - of its special limitations and potentialities, needs and aims. Architecture can give us an insight into this process just because it is so bound up with the life of a period as a whole". (Giedion, 1967. p. 19).

Although this statement may clearly serve as an indication of what the informational content of an artefact may be expected to be, it still does not provide with a model of the steps that need to be taken to reach a similar formulation for the case of "any" environmental form. And, since, additional care should be taken in the present context to retain the richness of this content, such a model should be based on several notions on the theory of the production of environmental forms. Ideally, this would have meant that what is needed is an outline of the rules according to which the afore-mentioned analogical similarities are allowed to take place.

One could argue that this may lie beyond the scope of the study of history of art and architecture. Yet, as early as 1964, Peter Collins, himself an historian, postulated that the contribution of history to theory of architecture should be based on the laws and rules which have been observed to allow form to be influenced (Collins, 1964). It seems that

although significant research has been done since then, the problem of attempting a theoretical construct based on analytical observation of the production of environment remains as it was. Very recently, Porphyrios put the question in a slightly different manner by postulating his conception of the "other" history of architecture as having to be based on "[the conception of] the historical relation between a result and its conditions of existence as a relation of production and not of expression". (Porphyrios, 1981, p. 99, his emphasis). This contention, which in fact attempts to put the study of history of architecture in a different perspective, may be said to be of particular significance as regards the methodological aspects of arriving at a satisfactory identification of the potential informational content of environmental forms as it puts the emphasis on the overall conditions of production of a form rather than on the aspects of the Zeitgeist which are expressed through the designer.

The problem of identifying the potential informational content of environmental forms as this is stored in them in the process of their shaping is not confined only to architecture and its closely related fields of study. In anthropology, for example, it exists as an empirical problem. The first hand study of a considerable number of societies has left the anthropologists with a substantial amount of evidence which could be employed to the direction of the needs of this study. Most anthropologists however, are not concerned with the production of environment as such. Furthermore, they seek to examine

particular information in man-made environment, such as the degree to which the overall spatial organization of a village plan corresponds to the concept the settlers have of the whole village or, possibly, the world.

Levi-Strauss saw in this aspect of spatial organization the opportunity to study the social structure of villages through its projection in space. But his approach was faced with unexpected limitations. In his book "Structural Anthropology, and, after citing several illustrations, he says, "these few examples are not intended to prove that spatial configuration is the mirror image of social organisation but to call attention to the fact that, while among numerous peoples it would be extremely difficult to discover any such relation, among others (who must accordingly have something in common) the existence of a relation is evident, though unclear, and in a third group spatial configuration seems to be almost a projective representation of the social structure" (Levi-Strauss, 1963, p. 292).

More related to the production of man-made environment and its communicative qualities is the work of Hall and Rapoport who deal with more aspects relating to the present context. Hall (1961; 1966) emphasised the communicative aspects of culture through its projection on spatial form and in relation to social and personal space. As he based most of his observations on contemporary societies, his work is of particular importance. Rapoport, on the other hand, being both an architect and an anthropologist, is in a position to provide a large amount of evidence to the

direction of the examination of the potential informational content of man-made environment. Indeed, his book "House, Form, and Culture" (Rapoport, 1974) which deals with the production of houses in primitive and traditional cultures contains a notable collection of illustrations of how material and socio-cultural factors affect the form of the end product. Yet, he does not attempt to go into the formulation of a theoretical construct which would provide an explanation for the totality of features in a house and which could also be employed in other cases of the production of environment and especially as regards to the complexities of modern societies.

On the whole, research in anthropology may be of much relevance to the particular problem of this study as it encompasses a large amount of evidence referring to the production of environment which is conducted by "non-institutionalized" designers. The problems it leaves is that it tends to be concerned with particular societies and particular kinds of potential information. Although by Levi-Strauss' statement it reaches a similar formulation as that of the historians, it still does not provide us with the means to explore it in different dimensions and as regards different circumstances so that one may have a whole picture of the richness of potential information in the environment. On the other hand, the same statement of Levi-Strauss suggests that the approach which will finally be followed in this context should account for divergencies in environmental forms as regards their content.

Finally, it would have been an omission if one disregarded geographical approaches in relation to the present study.

It appears though that in regard to the production of environment and the question of potential information stored in it they tend to be notably selective. Thus, although they provide an interesting overview of the matter, this can not help as a basis in the present context as it comes to faint reference to the question examined. Studies like Pocock and Hudson's (1978) deal with the perceived environment, whereas studies like Harvey's (1973), although concentrating on the relations between social processes and spatial form, tend to be concerned with the description of activities performed in space rather than spatial form itself. As Harvey puts it "[the meaning of space] is helpful in certain respects but it is another special view of space and I am not sure that it has any general validity for the examination of social activity" (Harvey, 1973, p. 28).

In sum, and in view of the criteria set, it appears reasonable to argue that, although the approaches referred to above may prove invaluable in their own right, none of them may serve as providing the foundation for the approach needed. At this point, it may be necessary to note that pure theories of architecture and design, such as Kevin Lynch's or Norberg-Schulz's, may not serve as a guideline either; at least, not in this context. The reason is that the potential informational content of the environment is to be explored through analytical observation and not through theories which may be either followed or not by

designers. As we shall shortly see however, such theories may help in the present context only if incorporated within a rigid working framework.

As there is no ready-made solution, the only approach left is to examine how the physical environment is transformed and to establish functional relationships between factors in the mechanisms of change and differentiation in form. The problem, then, is reduced to the exploration of the extent to which such differentiation may seem to be accidental, that is: bearing no perceivable relation to the conditions of its production or, to put it the opposite way, to what extent may the mechanisms of change give an account for the variety of forms in man-made environment.

As this study aims at examining man's cognitive experience of the entirety of man-made environment, the scope of the present part of the study has to go beyond the scrutiny of the so-called "institutionalized" design objects. Thus, it is essential that the environment is viewed in as much as the total production of environmental forms is concerned. This includes the exploration of functional relationships as regards "non-institutionalized" design processes.

1.1 THE COMPOSITE NEED FOR CHANGE IN THE ENVIRONMENT

Man builds his environment himself, his main aim being to use it. As everything else, man-made environment can be taken as the result of multiple "cause-effect" situations in which the cause is the need which asks to be satisfied

and the effect is the environmental form* which, through its function (e.g. when used), satisfies the need. This appears to be so whatever the scale of change in the environment and, indeed, such a change may range from the hammering of a nail into a wall to the production and implementation of a regional plan. In the same sense, environmental objects are produced as a result of a need regardless of the nature of this need (f.i. a house, a car, a statue in a park, a sign-post, an ice-cream, a piece of music etc.). In fact, one may hardly be able to visualize a completely "useless" object. Even forms which, by being the mere expression of a person's instantaneous feeling, seemingly serve no purpose at all (like, say, some graffiti on a wall or, 'the machine that does nothing') their "use" may be nothing but the expression of the very feeling that caused them. They may be of no interest once they are there; yet, their production corresponded to a certain need and they have been "used" accordingly.

Let us now consider any one of those needs that may serve as a cause for the production of an environmental form, say, the need for housing (that is: the need to protect certain human activities such as sleeping, eating and so forth against adversity). One does not have to search around the world to realize the immense variety of forms (houses,

* In the context of this study, the word "form" will be taken as "particular kind of arrangement or structure in which a thing exists" (Oxford Dictionary).

blocks of flats, huts etc.) that have been constructed to cover this particular need. Even when some of these environmental forms look similar, no two of them are identical if one considers all their features. Equal plurality in environmental forms can easily be seen to correspond to every single need that requires a change in the environment that is so even for extreme cases such as the commercially dominated production of an object like a pen - which mainly because of its size offers limited potentiality for variation; nevertheless, objects one uses to write on paper abound in shape, colour, image and even specification. This plurality of forms around us suggests that the opening sentences of this section (and especially the notion on the use of man's environment) are not as straight-forward as they sound. Although the statement of "cause-effect" stands, flexible as it may be since it operates at many different levels, it still is inadequate to provide us with a satisfying explanation for the immense variety of forms.

One reason to explain the variety of forms is that the "cause-effect" relation never stands on its own; it is always a relation within a given context. In real life situations, the need for environmental change, which in this context is assumed to generate the mechanisms of change, typically arises within a particular configuration of social relations at a given moment in time. As such, it inevitably incorporates a body of "by-needs" which stem from problematic situations, included in or "surrounding" the original need

and demanding solution. The end product is required to function in a number of ways which will have to correspond to these needs. To state Alexander's example, the design of a kettle apart from satisfying the need for heating drinking water, must also be handy, safe, economical and so on (Alexander, 1966, p. 60). Thus, the widened need for change, the composite need, comprises not only the original need, or needs, which we may call "primary", but also a series of "secondary" needs.

1.1.1 Design Methods and the Composite Need for Change

It is sad that there is very little research that has been conducted on the subject of unfolding the composite need for change. What is needed for the purposes of this section, would be theoretical formulations based on analytical observation of the process of environmental change that has already taken place.* Yet, as noted above, historians very seldom touch the subject of the mechanisms of change as such. And, if this is the case for, say, outstanding pieces of architecture, there appears to be practically nothing to be expected to refer to "ordinary", small-scale, every-day production of environmental form conducted by laymen.

In the attempt to explore the dimensions of the composite need for change in order to examine the relationship between need and form the only available material that may serve as a guideline appears to be found in design methods of the last

* There is no need to go into aspects of problem-solving theory at this stage as the interest of this section lies in describing the problem the producer of environmental forms faces and not the mental processes through which he reaches a conclusion.

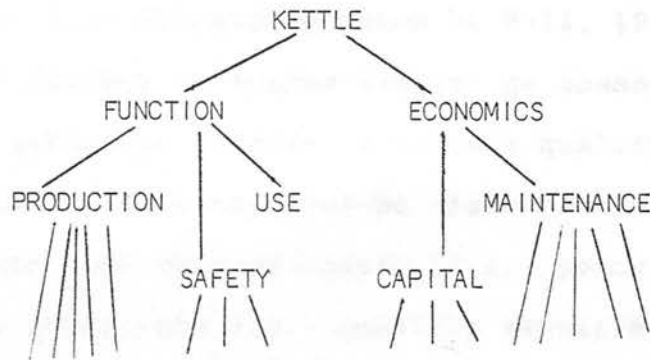
twenty years (f.i. Alexander, 1966, RIBA, 1965; Matchett, 1968; Broadbent and Ward, 1969; Jones, 1970). These studies usually refer to industrial design, architecture and urbanism. It appears logical to assume that the problems dealt by design methods are generally more complex than other production of environmental forms, such as everyday change in the environment. This may be expected to be so, at least in as much as the definition of the composite need for change is concerned. On the other hand, this line of approach may enclose several methodological errors. Firstly, design methods are basically theories and not analyses of existing situations. Yet, they would possibly not be of much use if they were not digested and turned into practice by the majority of architects even to the present day. As such, they fitted the circumstances (low budget, commercialised production, fairly quick "solutions" to problems etc.) and concretized the concept of functionalism to such an extent that they may be considered to be fairly close to describing how the majority of designers really think (Lawson, 1980).

Secondly, being a product of their time, they are generally characterized by a certain philosophy which limits their scope in that of the utilitarian aspects of the design problem since they generally deal with needs which are expressed in observable behaviour. There are criticisms aimed against these studies which refer both to this and to the whole idea of a design method at this stage of the development of design research. In the context of the present section however, the interest lies in the examination

of the composite need for change and its relationship to form. Therefore, criticism in the present context should concentrate on this aspect and, only when arguments on the overall philosophy or context become crucial, will they require further attendance.

Finally, the problem of the overall production of environmental forms (that is: including "non-institutionalized" design or other changes in spatial configurations) still remains an open question. It appears that there is little to be done at the moment apart from bearing it in mind until the end of the section where there will be an attempt to reconsider the description of the composite need for change, and the requirements it sets, in a wider context.

Let us now consider design methods in respect to their systematical view of the analytical stage of design. The most suitable for our purposes is the one based on Alexander's early work on the decomposition of the design problem, a study which proved to be highly influential for a significant period of time. According to this study, the design problem can be broken down to its constituent parts. Thus, it forms an inverted pyramid which starts from the function needed and, going through "by-needs" corresponding to functions or activities, ends up in listing the requirements which the components of the end product must satisfy (Alexander, 1966, p. 62; Jones, 1970, p. 31) (fig. 1).



- 21 requirements such as:
- it must pour cleanly
 - it must not cost too much
 - it must not be hard to store in the kitchen

FIGURE 1

As the composite need for change stems out of a particular real life situation, "by-needs" and their resulting requirements are a function of the users' "physiognomy" (e.g. their social and psychological characteristics). Consequently, the constituent parts of the composite need may be defined and solved in a number of ways and this can be limited as we bring together requirements set by "by-needs" referring to the same part. This can be achieved by implementing an interaction matrix of activities or functions which are required by such "by-needs" (Hanson, 1969).

The users "physiognomy" and the particular situation may, and, depending on the nature and scale of change, it usually does, influence all "by-needs" and requirements contained in the need for change. For example, a house which is supposed to satisfy the housing needs of middle-class people, apart from doing so, should provide a certain amount of privacy (this

has been put into measurable terms by Hall, 1961), a certain standard of decency in spaces within the house, adequate ground for gardening outside, a certain quality of finishing and so forth. There may even be discrepancies within basically the same kind of people (f.i. young couples, pensioners, immigrants etc.) possibly requiring further determination or specification. Even in commercially produced houses, where the users are not known in advance, a number of factors, such as sex, age, class, occupation and so on, are taken into account in an attempt to predict the users' particular needs (Tzonos, 1978, p. 39).

1.1.2 Basic Human Needs and the Composite Need for Change

Design methods, as they appeared mainly during the late sixties, aimed at reducing arbitrariness in design as much as possible. The end requirements were attempted to be so definable and, at the same time so natural (stemming from the supposedly objective nature of function or analysis) that they came to be accused of bio-technical determinism (Colquhoun, 1969, p. 268). Today there appears to be no need for fierce attacks (as f.i. Daley, 1969) as the alleged objectivity of observable behaviour is no longer carried to such extremes; Alexander himself has removed the deterministic element from his early theories in his recent work (Alexander, 1977; 1979).

Alexander's study on the decomposition of the problem, and the need for change, as described above, appears to be valid in as much as the utilitarian needs of the people involved are concerned. Nevertheless, as we will see

shortly, even these "by-needs" are affected by recent developments in research as regards certain aspects of man's experience of the environment. Such studies were based on the communicative properties of man's surroundings and emphasized the point that the environment has to be seen as functioning through its (not necessarily visual) image in a number of ways in response to different human needs varying in nature. Thus, Lynch, as early as 1960, referred to environmental clarity in relation to man's needs for orientation (Lynch, 1960, p. 7f: see also 3.3 for an extensive discussion of Lynch's thesis), Norberg-Schulz pointed out that environmental forms should contain existential meanings (Norberg-Schulz, 1963, 1971, 1980), Rapoport, amongst others, stressed the importance of keeping complexity in design at such levels that would be in accordance with an optimal perceptual rate (Rapoport, 1969, pp. 141-142; Rapoport and Kantor, 1967; Broadbent, 1973), Smith emphasized the importance of designing in accordance to the functions of the limbic brain (Smith, 1974, 1977) and so on. Furthermore, most of the recent developments in the field of semiotic and environmental psychology, as well as the concept of the cognitive needs developed in the present study, are either based or deal with human experience of the man-made environment.

The emphasis on man's experience of man-made environment and the significance of the function of its image in this respect is an attempt for a holistic approach to design. According to the design methods we mentioned, man was taken

as if it was possible to be described as a whole by merely employing his very apparent "physiognomic" characteristics (age, class, education, culture, sub-culture, apparent personality traits and so on). The analysis of the composite need for change was to take into account such variables and aim at producing a form by relating these to the "by-needs" which derive from the nature of the primary function. Yet, there is enough evidence to suggest that what man needs from the environment cannot be limited to the satisfaction of the practical aspects of his immediate needs. If this is so, it appears that one has to go far deeper into the psychology of the person to get a more accurate picture of man's needs and then relate them to the composite need for change.

In psychology, various theorists of personality have attempted to sketch an outline of basic human needs in the direction of establishing a theory of motivation. Abraham Maslow (1970) observed man in what he called an holistic - analytic fashion as opposed to the reductive - analytic behaviourist orientation, according to which the attitude of the physical scientist was assumed and man tended to be viewed as a passive reactive object whose needs strive for their own obliteration (f.i. H.A. Murray 1962, pp. 192-266). Maslow suggests that basic human needs are instinctoid and, to some appreciable degree, they may be innate and can be arranged in a hierarchical way. His hierarchy, in descending order, is as follows: physiological needs, such as hunger or thirst;

safety needs, such as security and protection from physical and psychological harm; belonging or love needs, which concern the relationship of responsive, or affectionate, and authoritative needs; esteem needs, or those needs of an individual to be held in high esteem by others; actualization needs, representing the desire to fulfill one's total capacities; and cognitive and aesthetic needs, such as the thirst for knowledge or the desire for beauty for its own sake, which are interrelated with the preceding categories. These steps - the exact nomination of which has been argued by writers (Warr, 1978, p. 258) - along the need hierarchy should not be considered a rigid, all-or-nothing, step-wise order of needs but rather an arrangement of relative satisfaction and emergence. In fact, Maslow suggests that "most people are partially satisfied in all their basic needs at the same time". A more realistic description of the hierarchy would be in terms of decreasing percentages of satisfaction as we go up the hierarchy of prepotency (Maslow, 1968, 1970).

It is beyond the limits of this section to go further into the implications of research conducted on the problem of human needs by other disciplines. What is interesting in the present context however, is to note two things. The first and most important one lies in the realization of the mere existence of such needs (whether innate, partially innate or learned) as being part of the human nature at some stage of the development of the individual's personality. The significance of this is reinforced if one assumes the

existentialist methodological approach of emphasizing the identity of the individual involved - as it is done by Maslow in his introduction of "Toward a Psychology of Being" (1968). Then, the individual is approached as a person in his own right and not as an organism merely responding to his environment in a stimulus-response fashion (Laing, 1965, p. 20). This viewpoint makes it clearer that it would be a serious omission to disregard the implications of man's basic needs whether as defined by Maslow or by anybody else. This evidently relates to the identification of the constituent parts of the composite need for change.

The observation above carries the argument to the second notable point which relates to the exploration of the instrumental (operational) character of a number of "by-needs" already identified. By definition, operational needs are purposive, functional steps in the direction of the satisfaction of a certain end, the primary need. They may be considered to be "quasi-needs" (Lewin, 1964, P. 109) in the sense that, on the one hand, they are subordinate to the dominant need while, on the other hand, they still function as though they were needs themselves. As it has been generally agreed that behaviour in any particular situation usually results from a combination of several needs (Lewin, 1964 p. 280), it does not seem unreasonable to suggest that the needs in question may retain the possibility of relating back to the basic human needs, even if this relation may sometimes be so remote

that it is apparently impossible to trace.

Based on the above, it appears that, in all "by-needs" identified in this section (and this includes needs identified by design methods as well as needs referring to the function of the image) it is reasonable to distinguish two components. The first is instrumentality as regards the primary need for change and the second transcends the scope of the particular function and relates directly to the basic human needs. Therefore, needs constituting the basic need for change appear to fluctuate between two poles from being basically operational to being closer to the basic human needs. For example, the need for the living room to be spaced so that it facilitates the activities required is mainly operational while the need for balanced homeostasis and tension for the individual user may be expected to affect all different cases of production of environment since it is closer to man's basic needs. Naturally, several "by-needs" may appear to be in the middle as both components may be equally stressed. The need for a directional traffic sign to be clear, for instance, refers both to the particular function of directing the person quickly and efficiently and to his safety and cognitive needs in the sense that it should not be confusing or produce anxiety.

The different constituent parts of the composite need can not be easily classified and structured according to their relative significance for man in relation to the particular

function. Although a lot of research has been done in psychology and psychodynamics, there is still no clear theoretical formulation as needs are very complex in origin, structure and nature. Furthermore, such a differentiation should be expected to vary according to culture, nature and scale of environmental change and so on. Nevertheless, in as much as they describe the problem and indicate the dimensions of the composite need whether as the means to an end or else, such needs may be considered to be of equal importance.

1.1.1.3 The Composite Need for Change Seen In a Wider Context

Let us now attempt to relate the composite need for change, as it has been identified based on experience from "institutionalized" design theory and practice in present day societies, to the much wider context in which production of environment takes place. Maslow suggests that basic human needs appear to be similar for different cultures even though their expressions may vary widely. He also notes that his classification of basic needs is in part an attempt to account for this unity behind the apparent diversity from culture to culture. At this point, one has to assume that the outline of the composite need presented above is fairly close to reality and thus covers the problem (primary need for change and function, operational needs to the function and more basic needs which also have to be satisfied). Then, it appears reasonable to suggest that in a different context with different norms, standards, values and so on, people have been and will continue to

produce environmental forms in response to their degree of gratification of similar basic human needs. In close interaction with this individual gratification is the social and cultural dimensions which, in the case of primitive peoples for example, required the production of intensely symbolic (religious, cosmic, mythical) environmental forms. Such discrepancies in the need for change, arising within a particular configuration of social relations, are to be expected from such a different context. Yet, as can be seen from illustrations in studies such as Rapoport's (1974), the implications referring to needs deriving from the function (whatever that is) or to basic human needs follow the general lines of the outline given above.

The same can be said to hold for cases of everyday "non-institutionalized" production of environment. The basic difference may be that there appears to be a significant degree of abstraction in several aspects of the composite need for change depending on the case and, naturally, the scale of environmental change. When a housewife arranges the furniture in her living room for example, the "by-needs" are not usually attended to one-by-one. Yet, it appears that they are all potentially there (f.i. operational needs such as dining area next to the kitchen or some space to be left behind this chair for people to pass through, or needs for privacy, say, to block the neighbour's vista, and aesthetic needs, in the form of "it just looks nice"). How the "doer" acts upon the composite need exceeds the scope of this section.

From the above it can be seen that when the need for change is widened as it actually is in reality, (that is: comprising "by-needs" which may fluctuate from being basically operational and instrumental to being more directly related to man's basic needs) it may account for a much wider variety of forms than what the original abstract concept does. If one considers how the composite need is structured in terms of "by-needs" and requirements which correspond to functions which are to be performed by the end product, then one may argue that the composite need may be regarded as a system of hierarchically ordered "cause-effect" relations which operate at different levels. This is not meant to be a determinist stance as the purpose of this statement is to attract attention to the "cause" rather than to imply that there is only one "effect", or end product, which can satisfy it. In this sense, it appears reasonable to agree with the view that constraints, which are exerted on the designer by the particular situation he faces, may act as generators of form (Lawson, 1980, p. 77).

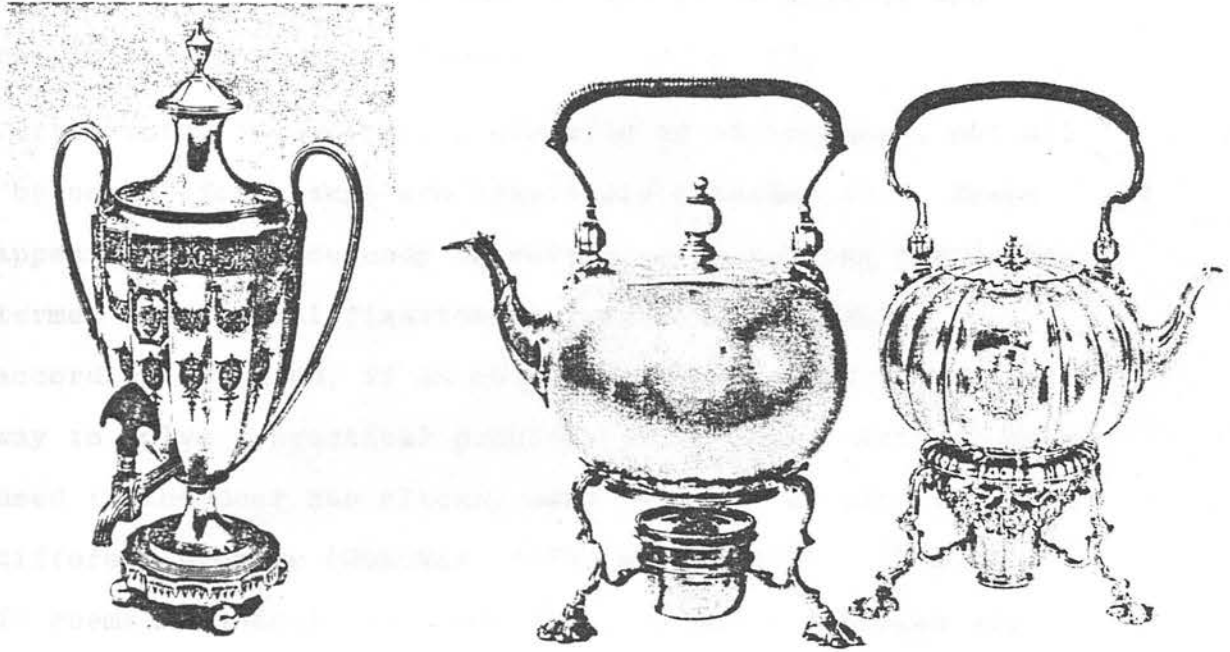
But if this is so, the question that arises is how much does the composite need for change end in requirements as regards the features on the end product and to what extent does it generate these features. In other words, to what extent may the concept of the composite need for change, in its most widened form, provide us with a reasonable explanation for the variety of environmental forms.

1.1.4 The Composite Need for Change in View of the Variety in Forms

At this point let us go back to the examination of a single,

isolated change in the environment. One may postulate that in the production of a single environmental form one or more people (acting by and large as a group) with a range of ideas, ideals, experience, behaviours and techniques (either concrete or vaguely formulated) interpret a given situation which consists of a certain configuration of social relations and has somehow become problematic. This interpretation is carried out according to their past experience and their overall motivation in life, both of which inevitably have to do with their position in society, their values as well as their particular interests as regards to the given situation. They find that something needs to be done, they identify this composite need depending on their interpretation of the given situation and they implement its solution. Naturally, the end product is asked to satisfy the need that triggered its creation as well as the "by-needs" that have been identified by the designer. Nevertheless, as one can readily see in the above description, this end product remains the result of a complex process.

Depending generally on the scale of environmental change, one can identify a variety of parameters which interfere in the production and may mark the shaping of the form. Along with parameters having to do with the doer, or doers, such as personality traits, aims and objectives, conflicting interests amongst the people involved and so on, one may list a series of external ones, which may range from available materials and technology to legislation and era or class models. (Fig. 2).



Although a kettle is a mainly functional object with some degree of specificity, these contemporary (18th century) kettles vary notably in form.

FIGURE 2

It is interesting to note some differences between modern designers, on the one hand, and traditional or "non-institutionalized" producers of environment, on the other, in as much as their approach to the problem is concerned. Alexander argues that traditional form-makers learned their skill through imitation and correction (Alexander, 1966, p. 36), while Jones gives examples of craftsmen who were not aware of why they had tackled a particular problem the way they had done (Jones, 1970, pp. 17-18). Rapoport on the other hand, having studied a remarkable number of anonymous, primitive or not, settlements,

appears to suggest that this is to be accounted on the relative significance of social factors in general and not imitation as such (Rapoport, 1974, p. 73).

Furthermore, in everyday production of environment, not all "by-needs" for change are creatively attended to. There appears to be a tendency to what problem solving theory has termed "functional fixation or functional fixedness" according to which, if an object has to be used in a novel way to solve a practical problem, it is less likely to be so used if the doer has already seen it used, or used it for a different purpose (Duncker, 1945, pp. 85-110). (Fig. 3). It seems reasonable to argue that, if one visualised all possible forms which could result from the requirements of composite needs, this tendency from the doer's part would reduce them considerably, as it presumably does in real life situations.



The first cast-iron bridge of Abraham Darby at Coalbrookdale in 1779 is very reminiscent of the stone arch.

FIGURE 3



Even in societies where considerable time is spent in life-sustaining tasks, there is still a great amount of time devoted to "frivolous" nonfunctional tasks, such as ornamenting functional objects like this Maori canoe from New Zealand.

FIGURE 4

Additional complexities arise from phenomena such as the division of labour in present day societies, the emergence of producers, distributors, systems operators and so on (Jones, 1970, p. 7), the role of marketing and advertising in creating new needs or giving shape to latent desires (Schmittel, 1975, pp. 173-175), the increasing tendency for the consumption of the image of objects rather than their function in the conventional sense (Debord, 1971; de Ventos, 1980, pp. 183-190) and so forth. On the architectural level, Hillier appears to be well aware of this as he suggests that a building has to be seen as

operating at certain levels (by being a climate, behaviour, cultural and resource modifier) rather than concentrating on the functions alone (Hillier et al, 1972). In a similar sense, Rapoport approaches design as having four properties, namely: the organisation of space, meaning, time and communication (Rapoport, 1977, pp. 10-12).

It was the belief of functionalists that "not only the form of an object or building should express its function, but the form should be inevitably and uniquely determined by that function" (Brolin, 1976, p. 36). Yet, even in technical objects, which according to Bense require the highest degree of specificity or criticality (Krampen, 1979, p. 10; Rapoport, 1974, p. 87-89) this determination is not attainable (Fig. 4). It has been said that even in the spaceship capsule, which is unique for its complexity and specification, the designer was still left with several choices. Even if the requirements of the composite need sometimes appear to be unlimited (Lawson, 1980, p. 71), there still seems to be wide area of choice in the final configuration (Colquhoun, 1969, p. 270).

It seems that the composite need for change, however generative of form it may be, can not determine the end product. The "cause-effect" relationship between need and form (or, function, which this form is to facilitate) proposed earlier appears to be furnished with a notable number of parameters which also take part in the shaping of the resulting spatial form. Although the composite need for change, and especially the primary element in it,

demands the production of environment and, as such, generates form, the end product, in the totality of its features, will only be a function of this need.

1.2 THE REPRESENTATION OF SOCIAL RELATIONS ON ENVIRONMENTAL FORMS

1.2.1 The Alternative Approach and the Concept of Social Relations

For a comprehensive analysis which may lead to an adequate explanation of a much wider range of environmental forms than can be accounted for by the composite need, one is impelled to approach the problem at a different level. Such an approach should provide the means for the examination of the way in which the widest body of parameters, which somehow are involved in the production of environment may affect the particular shape of the end product. The general view that the built environment is a reflection of the social environment may serve as an indication of this direction.

After exploring the implications of the composite need for change and the problematic situation itself, the above stance may also help on shifting the level at which we approach the problem. Therefore, the new approach should be based on a somehow universal point of departure so that it may incorporate all the complexities of environmental change, while, at the same time, it should be sharp enough to penetrate in such a complex domain to meet the particular aims of this study.

The statement which is to serve as the universal point of

departure is that a major way in which man adapts to the natural environment is by transforming it physically* to meet his needs. The two large domains that interest us are "man" on the one hand, and man-made environment, for the production of which the natural environment is employed as its raw material, on the other. What is needed is a concept that will give a measure of "man" and, at the same time, without losing its global scope, may prove useful to give an account for differentiations, e.g. "bits" of potential information, in man-made environment.

The proposed concept in this context is the concept of social relations and the working hypothesis which is going to be tested against non-experimental analytical observation is that "in the process of production of man-made environment, social relations which have to do with this production may become represented, or objectivated, on the end product". The problems of this part of the study is then transformed (or reduced) into exploring the extent to which the above function may be held accountable for the variety in forms and the potential informational content of man-made environment.

What is meant by the term "social relations" is all possible

* Apparently, the physical way is not the only way in which man adapts to the natural environment. In primitive societies, man applied meaning to natural phenomena and identified them with the forces of "good" and "evil". There is also the well-known example of a tribe in Western Australia, the Pitjendadjara, who, although, they still carry on leading a religious and moral life of great intensity, employ minimal physical transformation of the natural environment (Redfield, 1953, p. 16).

relations in society, everything that stems from man's being-in-the-world. They are structured in a hierarchical order and operating at many different levels so that they might be seen as spreading from the field of psychology, through social psychology, to that of sociology. Such relations may be relations between individuals, groups of people, between individuals or people and things or concepts, even a single person's attitude to the rest of the world and so on. The concept of social relation evidently incorporates at least a notion of both its poles and it may happen that one of these poles may not be obvious, nor the relation "established" in the strict sense of the word. For example, the fact that a single person may be depressed at a given moment in time may not seem to be a "social relation" generally, but it will be taken as one in the present context since, if the person is one pole, the other pole may be society in general, or some aspects of it or the person's prior experience of his social environment. Thus, the form "social relations" in this context is used in a much wider sense than it is used by Levi-Strauss (1963, p. 279, for example) as it operates on the psychological level, including the functions of the unconscious part of the mind. But the definition of the concept of "social relations" is not enough to set the approach. What is also needed is a conception of the channels through which social relations are hypothesized to pass so as to become represented on man-made environment. Such a conception should be required to fulfil the criteria set in 1.0.

Following the problematic which led to the present approach, the examination of the representation of social relations on environmental form has to be separated in two stages. The first stage deals with social relations which are channeled through the composite need for change. Although this stage will be based on the discussion in 1.1, it will still have to be typically different as it is put in a new context. The separation in two stages is fundamentally important in order to retain the relative significance of the need for change in respect to other parameters affecting the production of environment.

During the second stage, the interest lies in examining how a whole range of social relations which may have little or nothing to do with the need for change manage to become represented on the end product. To trace such social relations in a systematic way, one is forced to shift one's point of attention from the user to the doer, that is the person or persons who finally produce environmental forms. There are two, fairly distinct, channels through which social relations from the whole social environment (apart from the composite need for change which describes the user and the particular situation as such) may become represented on environmental form: one of them is internal, and the other external to the doer (Heider, 1958, p. 82; Hillier, Musgrove and O'Sullivan, 1972). That is: they are either channeled through him and this makes him somehow responsible for the outcome, or they lie beyond his reach. The first case we can call the "internal factor" and the

latter will be the "external factor" in the representation of social relations on environmental forms.

Now that the working hypothesis and the methodological means through which it will be tested have been laid, let us consider a few aspects of the issue which appear to be needing further clarification. Firstly and in reference to this alternative approach as a whole, social relations will be treated as the independent variable since what is studied is the shaping of man-made environment. Even in cases in which a particular social relation may be a function of an existing spatial form (and this may be expected as such a social relation may be a relation between an individual or people and a thing, in this case the form), it may again be considered an independent variable in the face of the forthcoming environmental change in which it takes part (Harvey, 1973, p. 40).

Secondly, it appears reasonable to assume that all production of man-made environment results from the transformation of natural environment which is treated as raw material to this end. Yet, environmental change does not necessarily begin from scratch. In this sense, the redecoration of a room, in which existing pieces of furniture have been arranged differently, is again a case of production of man-made environment. In a totally opposite sense, the same can be said for the landscaping of or, even, the intrenchment of a large park within the city.

Furthermore, when one deals with modern societies one should

take a closer look at the implications of the division of labour and the fragmentation of the production-use relation, which has been mentioned above. Commercialized production depends heavily on demand and, in fact, as elementary textbooks in economics will readily underline, it is a function of demand. In the context of the present study, it appears reasonable not to confine ourselves to the first leg of the above relation only, e.g. the process of designing and producing an environmental form as such. The process of selecting and purchasing such a form may be considered to be of equal importance as it reproduces the original production. In addition to this, the purchaser, apart from bringing his purchase into a different context, retains some of the characteristics of the producer-user since he interprets his own needs and covers them by the acquired product after careful selection which is a function of his interpretation.

Lastly, several channels through which social relations become represented on environmental forms may appear as overlapping with channels of a different category. This is to be expected since the actual production of environment is a complex whole which is dealt with in isolation in the present context for methodological purposes. A woman, for example, may buy an expensive elegant dress and wear it every day for at least two reasons: either she thinks that this is the kind of dress that really suits her personality or, understanding that for some reason she does not suit it, she wants to convince the others that she does. Either could have

happened and one has to know the person to have a chance of really knowing. A similar situation may have been expressed through two different channels simultaneously. A theoretical model like the one proposed in this context can not do else than isolate each functional relationship. This must not be expected to affect the validity of the approach which is not concerned with the measurement of potential information or with the identification of all channels through which social relations manage to become objectivated but with examining the functions which sustain the richness of the content.

1.2.2 Social Relations and the Composite Need

The first group of social relations which may be reflected on environmental forms are those which have to do with the composite need and the corresponding use-value that lies behind objects. As we have seen in the previous part of the chapter the part of the composite need which constitutes the primary need is the one that calls for the object's production. The object by its form is asked to help take place, or to facilitate the function the need requires that is, the primary function.

Nevertheless, in its essence, the primary need alone remains a theoretical construct* since it arises without being yet furnished with other "by-needs" which would readily provide it with dimensional perspective in space. Consequently,

* e.g. an abstract, rather than substantive, entity.

social relations of the primary need get represented by the mere existence of the environmental form.

These social relations can be seen in two levels: those social relations that have to do with the need which led to the production and use of a particular environmental form and those which define the significance of such objects' use for man in general. For example, the existence of a bar of soap or a collection of cosmetics in somebody's bathroom is a result of both the idea of cleanliness or cosmetic treatment seen within a given broad social context and of the fact that this person in particular seems to conform with this thought for certain reasons that have to do with the way he/she sees himself, or herself in society. (Fig. 5). If cultural norms, or the person's attitude to these, were different, then those objects wouldn't have been there and their absence would have constituted one objectivation of these social relations.

In the same sense, the fact that New Towns have been built, and exist, in the pariphery of Glasgow or London is the result of, and consequently represents, an extended complex configuration of social relations such as the condition of inner city areas, certain requirements of industry, priorities set by decision-makers and so forth. This configuration of social relations, naturally, is represented by all environmental objects it give birth to, and in their totality of physical features; that is, not only the houses of, say, Cumbernauld, but also the headings of buses which

have been introduced for servicing the town, the change the emergence of Cumbernauld brought in the country's maps etc. correspond to the afore-mentioned social relations. (Fig. 6).

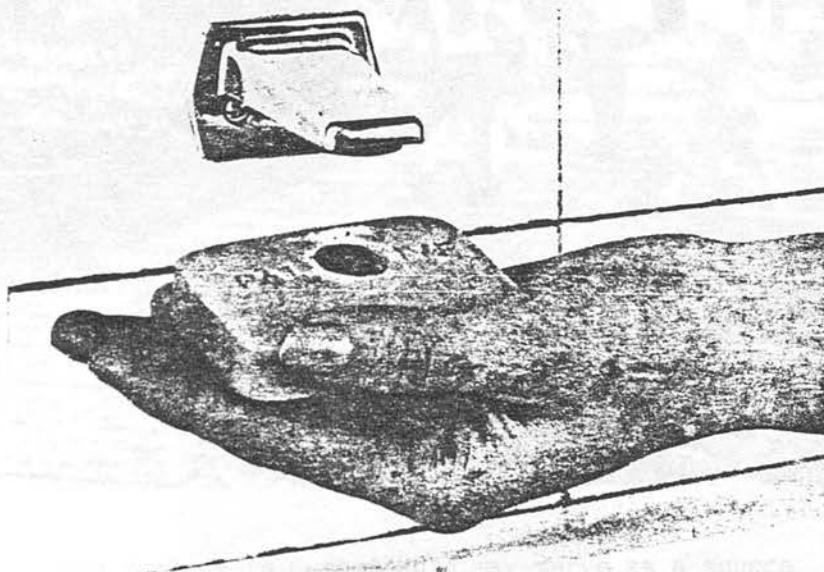
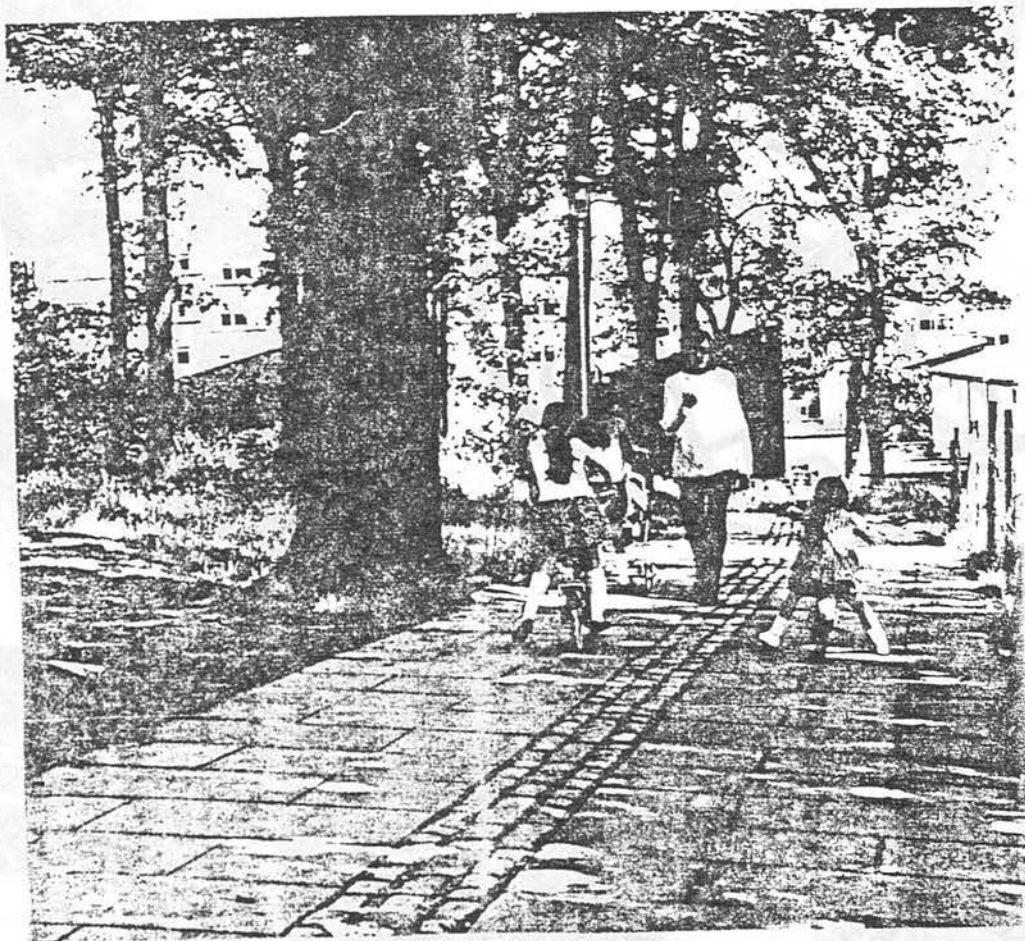


FIGURE 5

Let us now proceed to the scrutiny of the rest of the elements in the composite need in terms of the social relations they allow to become represented on environmental objects. In the preceeding sections, we have seen that primary needs are furnished with a number of secondary "by-needs" which stem from the social relations concerned with the user, or users, and the problematic situation. The social relations that lead to the production of a chair,



Any feature in Cumbernauld may serve as a source of information about the social relations which led to the emergence of the town.

FIGURE 6

if taken in their entirety, as is always the case of real life situations, will not produce just any chair. Instead, they will lead to the production of either a kitchen chair or an "electric chair", and so forth (Fig. 7). As far as these aspects of a chair's form are concerned, they are a typical result of the operational needs involved in the need for sitting. As such, they constitute objectivations of the user's "physiognomy". As noted before, different users

have been introduced for servicing the town, the change the emergence of Cumbernauld brought in the country's maps etc. correspond to the afore-mentioned social relations. (Fig. 6).

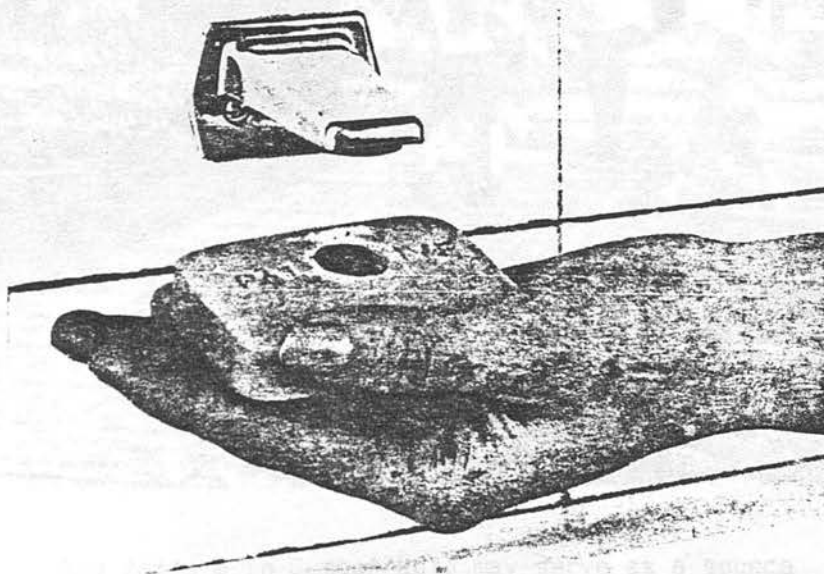


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will "fit" differently into the function of, say, housing. This will have its effect in concrete spatial form whether the user is the builder of his own house or whether he is choosing one from those which exist in the market. (Fig. 8).

Apart from letting social relations of the user's "physiognomy" become represented on spatial forms, "by-needs" still retain their character as needs (f.i. windows in a unit such as a house may be seen as autonomous units since they satisfy the need to let air and light come through and not to isolate the inside from the outside). Consequently, they also serve as channels for social relations, similar to those of primary needs, to get through and become represented by the object's more existence. A house with few or no windows may be the result of the owner's tendency for seclusion or isolation (Fig. 9). George Megas refers to examples of houses in Thrace in which, for reasons of security, i.e. because of the need to isolate the inside from the outside, have more holes in the roof to allow air and light come in (Megas, 1969, p. 22).

A combination of the two roles of operational needs in functioning as channels for the objectivation of social relations can be seen in cases of spaces which consist of many small objects and are used intensively as a whole. A student's room may serve as an illustration in this case as one may say that production of environmental form takes place continually since there is a constant rearrangement of the total spatial configuration to meet certain needs. (Fig. 10).



Doing one's washing may be carried out in a number of ways which result in the employment of different environmental forms and arrangements. Whether one will go for the more labour intensive or the more capital intensive solution is a function of one's priorities in view of the money available.

FIGURE 8



Windows and openings are scarce in the tower-like structures of Vatheia, Greece. The settlers' adverse relations with other villages resulted in the need for security taking precedence over ventilation and lighting needs.

FIGURE 9

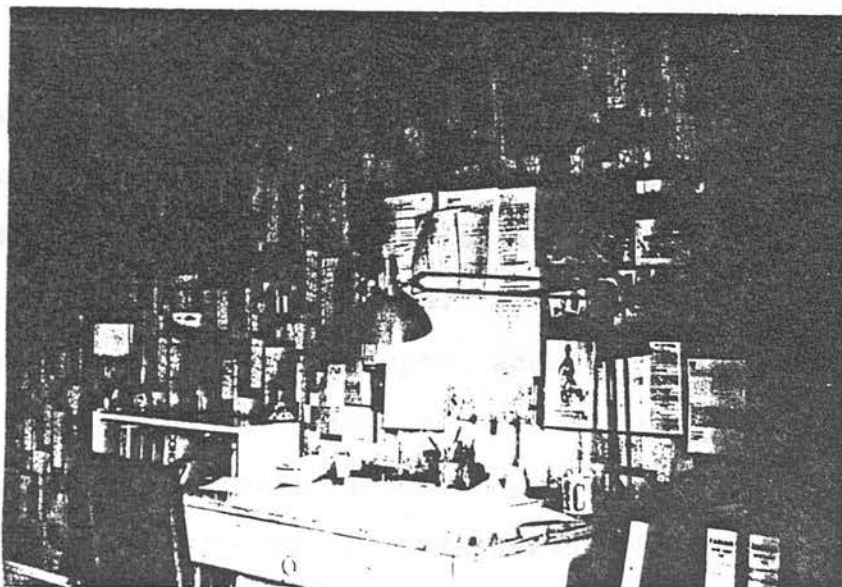


FIGURE 10

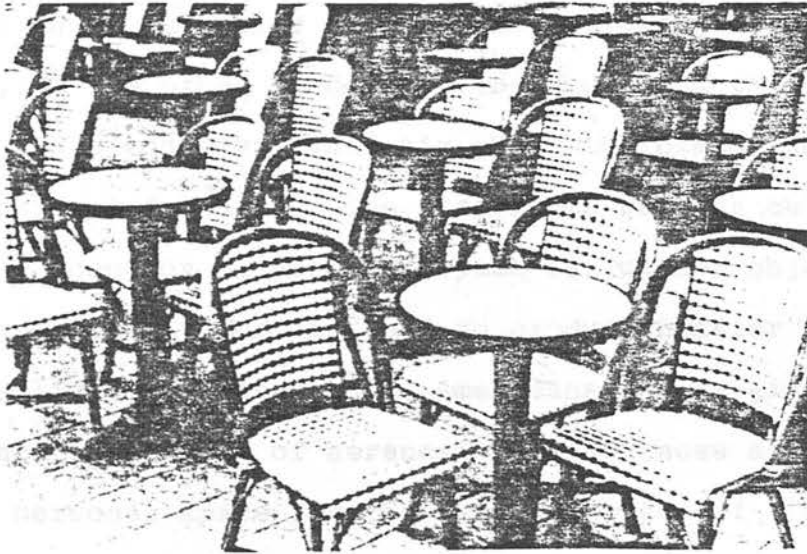
Social relations, concerning the user's "physiognomy, or even personality or degree of gratification of basic needs, and the wider social context, are highly involved in all these environmental changes. The mere fact that this situation as a whole occurs is a result of a complex set of social relations such as: high rents, students are generally poor, students are in between being supported and protected by their parents and, on the other hand standing on their own economically, man may suffer living in such conditions in order to achieve something and so on. Furthermore, each and every book or article on the studying desk or elsewhere owes its appearance to the particular mode, in which this particular student (who has had a certain experience of the world so far and a certain conscious and unconscious motivational content towards life and things) in the particular context that he finds himself in, attempts to solve his problems either practical and immediate or more abstract and long-term.

What we have seen up to this point suggests that social relations are represented on environmental forms by the very fact that the form as a whole, or a functional part of it, exists regardless of its shape. The task of letting "objects", which are still merely concepts, acquire dimensions, shape and texture rests on certain aspects of the basic human needs and especially Maslow's first category of them, the physiological needs. Several of these needs, which have to do with the human body or the use of materials, can easily yield standards to be met. One aspect of such standards can be seen in

handbook manuals, such as Neufert's, where they have been codified. They are usually taken for granted as their validity is supposedly absolute.

Yet, to a certain extent they fluctuate and by doing so they allow additional social relations to become represented in concrete spatial form. Hall's (1961, 1966) and Gehl's (1978) theories on physical and psychological dimensions indicate the role of personal factors in this. For example, a spacious bathroom and a soft of stylish armchair are on the luxury side whereas a bed carved in rock is not. In a similar sense, the spacing of tables in French cafes is different to what it would have been in England although manuals would have given one measure for the distance between the backs of two chairs, as far as the operational need of getting through is concerned. (Fig. 11). Different conceptions of the idea of man's personal space has resulted in the objectivation of this discrepancy. This includes social relations such as the relationship of an individual with other members of his culture as a whole, the threshold beyond which he would be threatened as a person (and this comes in close relation with the gratification of safety needs) and so on.

There may be numerous illustrations of discrepancies in dimensions, shape and texture of forms, from that which could be said to be the "standard" and, as these are a function of the users' "physiognomy" in the deepest sense of the word, this involves social relations of both psychological and socio-culture nature. Differences



The crowded spacing of cafe tables in France indicates the French tendency to pack together more closely than do northern Europeans, English and Americans.

FIGURE 11

between Spartans and other citizens of ancient Greek cities or between the Incas and the Pueblos as regards standards of comfort (Rapoport, 1974, p. 91) or Americans and others as regards noise levels (Baranek, 1966) and their objectivations in spatial form may illustrate this point.

As such needs move from the physiological to the purely psychological, however, the absence of concrete dimensional standards makes the objectivation of social relations hard to trace. This can be seen in the case of the problem caused by the "open door" policy of a branch of an American firm in Germany in regard to the safety needs, primarily, of the people involved. "In this company", Hall writes, "the open doors were making the Germans feel exposed and gave the whole

operation an unusually relaxed and businesslike air. Closed doors, on the other hand, gave the Americans the feeling that there was a conspirational air about the place and that they were being left out". The difference between cultures in their conception of personal space is further objectivated by the fact that Germans tend to produce heavier chairs and more solid doors, than, say, Americans do, to give a more distinct indication of hereness and thereness as regards their personal space and the personal space of others (Hall, 1966, pp. 127-128). Most psychologists, whether they follow the Lockean or the Leibnitzian tradition, would agree that psychological constructs, such as the conception of personal space, are to a degree learned. Consequently, as Germans have been experiencing doors being closed and chairs being solid (these characteristics in this case forming something like a code) in relation to their basic needs, and especially safety needs, their interrelation seems inseparable to them and they will tend to reproduce it in every production of environment. (See 1.2.4 for the doer's input).

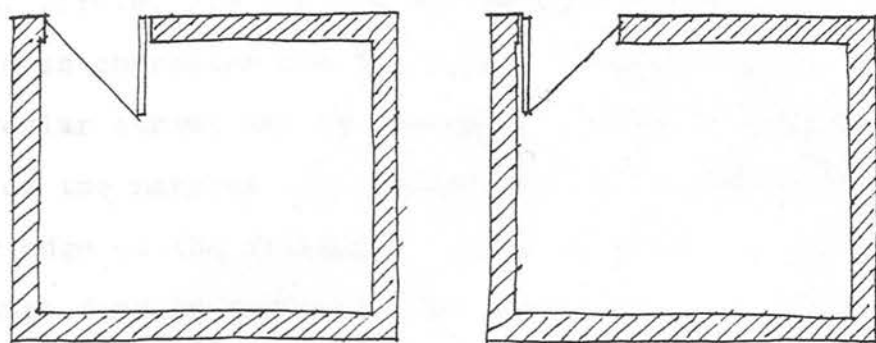
Another interesting illustration of "by-needs" which relate to the basic human needs may be seen in the way the need for privacy affects the way doors actually open (Fig. 12).

From what can be observed in Britain, doors tend to be designed so that the person who enters a room faces the nearby wall. One may presume that this solution, which is typical of older buildings, is a response to the need for privacy of the occupant of the room. Yet, in other cultures, in Greece for example, this need is not considered

to be so important as to demand any requirements for design in relation to this particular problem. The operational need of attaining maximum space when the door is held open is left to determine the solution. Different social relations in each case set different priorities. The idea of privacy was so developed in Britain that it constituted an essential constituent part of the composite need for change.

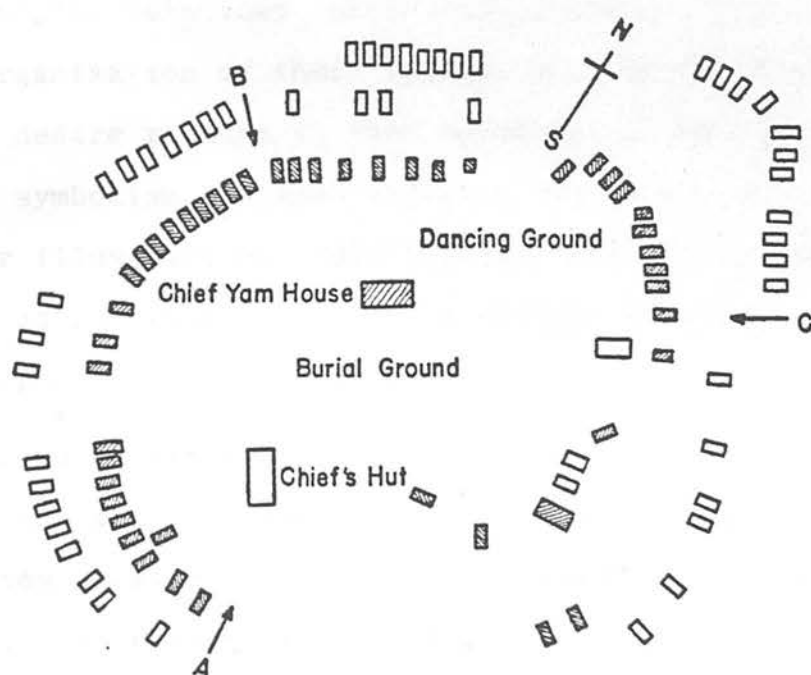
The illustrations above describe how discrepancies in the users' basic needs may serve as channels to objectivate different social relations, which have to do with these needs, on specific components of the end product. Let us now see how such needs may leave their traces on the end product taken as a whole. Levi-Strauss maintains that a large number of native societies have consciously chosen to project into space a scheme of their institutions (Levi-Strauss, 1963, pp. 331-332). From what has been discussed in the previous section, it does not appear unreasonable to suggest that such societies realized, to an extent, the function of the image and acknowledged the need for the overall spatial form of their settlement to attain symbolic meaning. Then, at least in as much as the overall layout of the settlements is concerned, the design corresponded to the people's cognitive needs in relation to the needs for safety and the needs of belongingness, as its hierarchical organization was an image of the world for them.

The village plan of Omarakana in the Trobriand Islands of North Western Melanesia, (Levi-Strauss, 1963, pp. 136-137),



The way doors open in Britain (Left)
and in Greece (right).

FIGURE 12



Plan of an Omarakana village

FIGURE 13

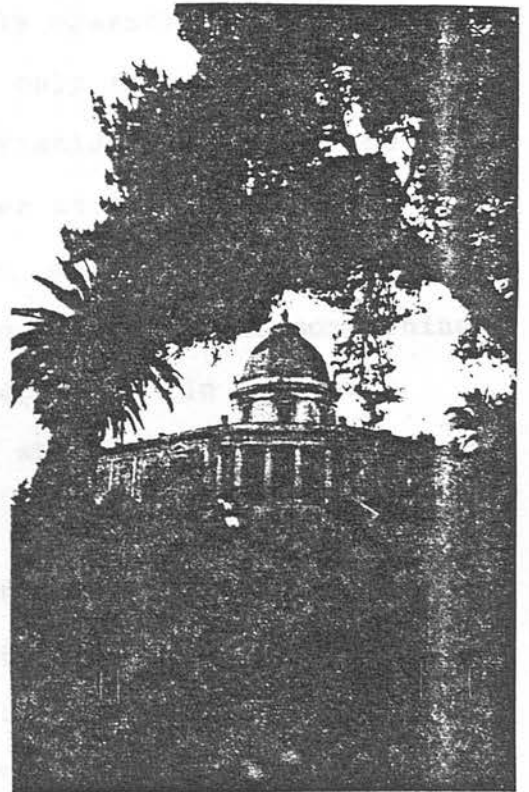
for example, shows such an organization (Fig. 13). The chief's hut is located in the middle along with certain important communal activities, such as the dancing ground and the place where the dead are buried. Around them, in a neat circle, are the yam storehouses which are elaborate, sacred in character and the object of many taboos. Beyond a circular street and in the same concentric pattern, the huts of the married couples were built in what forms the outer edge of the village. It is interesting to note that although food is stored in the inner ring, cooking and consuming it takes place only in or around the family dwellings of the outer ring. The significance of this illustration in this context however, does not lie in observing various social relations which characterize the culture as such, but in the fact that the villagers felt the need to turn these relations into symbols in space. Therefore, amongst all other social relations, their consciousness of the hierarchical organization of their village and the world and the strong desire to turn it into concrete, as well as rather strict symbolism, is also objectivated in the end product. Similar illustrations, relating not only to villages but houses as an "imago mundi" in a smaller scale, may be found in Rapoport (1974, pp. 76-87).

It is hard to trace projections of the need to make sense out of one's environment in the context of contemporary societies because of the division between "user" and "doer". As this section refers to how the composite need, as it really is, may serve as a channel for the

representation of social relations on environmental form, problems arising from the interpretation of the need from the doer's viewpoint will be dealt with later. Still, in as much as the everyday production of environment is concerned, one may note people's reactions in modifying the environment in which they live. (Fig. 14).

In Britain, the front garden has traditionally been the area on which residents express themselves. In Greece, it is typical of families occupying a flat in a working-class apartment block to paint the walls of their balconies in strange colours, wherever the law accepts this. The reason behind this is to give some identity to the place which would otherwise be neutral and bleak. "Their" flat has to stand out. In the end, the whole apartment block is characterized by a series of patches of different colours, as though there were a hidden competition amongst the families to outdo one another. This confusing but, in a sense, amusing activity helps as a channel to objectivate the relation between the need for preserving, transmitting and re-experiencing one's identity and the extent to which this may be suppressed by an architectural scheme. These people felt that the need for housing involved more "by-needs" than what the designers thought.

To conclude, this section, it appears that social relations, which may be represented on environmental forms through the composite need for change, are relations which refer to the user or the problematic situation (when the user coincides with the doer, they refer to the qualities of him as a user,



There are a number of ways through which people express identity in relation to their homes. As it can be seen in the illustrations above taken from Athens, this may be achieved by means of some paint or flower pot by the entrance on the one hand, or by features such as the imposing dome of the impressive suburban villa, on the other.

FIGURE 14

as opposed, for instance, to his expressive behaviour when producing). Since the user on the problematic situation can not exist independently of the broader social context, they inevitably refer back to this, as for example in the case of the bar of soap and the concept of cleanliness where amongst the social relations represented on the bar of soap was that of the overall significance of the idea of cleanliness for mankind. Furthermore, in as much as the purely operational needs are concerned, at first it appears that only the user's describable "physiognomic" characteristics may affect the end product. Yet, when one looks closer at the user's basic needs, one may observe that they, too, may affect it and serve channels for the objectivation of social relations concerning the users inner psychological development. In a generic sense, such social relations may be what characterizes cultural attitudes.

Social relations, which are represented on environmental forms through the composite need for change, are singularly significant as they appear to be responsible for the broad outline of the dimensions, shape and texture of spatial form, to say nothing about their mere existence. When operational needs are seen as functioning as needs in their own right, this may be said to happen as regards to the components of the end product, which then becomes a system that can be further divided into subsystems. "By-needs" which relate to the basic human needs may affect all such subsystems, since a

function of them may be found to be a subsidiary component of operational needs. When approached as functioning in their own right, such "by-needs" may still leave their trace as spreading all over the spatial forms, as they may also affect the shaping of specific elements in it.

1.2.3 The External Factor in the Representation of Social Relations on Environmental Forms

As noted above, the variety of features in environmental forms can not be explained by the composite need alone. The superfluous complexity, if not accidental, appears to be sustained by a series of social relations which have little, or even nothing, to do with the user and the composite need. In 1.2.3 and 1.2.4 the aim is to examine how a whole range of such social relations may manage to become represented on environmental forms as well as what kind of social relations would these be.

For this, and in accordance with the methodological model outlined in 1.2.1, it is essential to shift our point of attention from the user to the doer, that is the person, or persons, who produce environmental objects. In the production of environment, the doer is subjected to a series of limitations, (Banham, 1964). These limitations which lie beyond his reach constitute the external factor in the production of environment. As this factor originates from either natural or social phenomena, one may distinguish two aspects of it: the natural and the social.

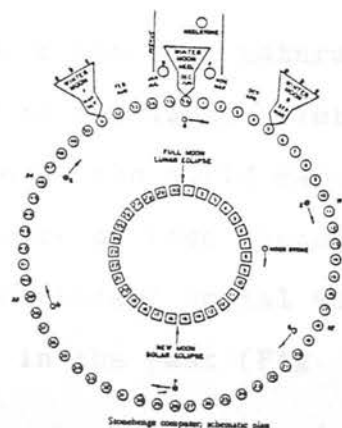
The natural aspect of the external factor has its origins in the natural environment to which man adapts himself

through environmental change. In a strict sense, materials as well as all natural phenomena are by definition devoid of any social relations. As such, they can not represent any social relations by their mere existence. The fact that Scandinavian houses are made of timber, or that in Britain one may build high using elementary structures since there are no earthquakes in this part of the world, is a natural consequence of availability of materials or topography and is not expected to portray any social relations.

Yet, this is not exactly so, for two reasons. Firstly, both materials and phenomena get infused with social relations following their use and subsequent significance - some of which may have nothing to do with their use as such, as for example in the case of primitive peoples - both in the history of mankind and for a particular configuration at a given time. Secondly, in the production of environment, in real life situations, there is always a certain degree of availability of materials, a certain array of locations where one can build a house without travelling very far and so on. These restrictions, naturally, limit the doer's scope to such an extent that this has given rise to views of material or topographic determinism of theorists, (f.i. Evans - Pritchard, 1960, p. 63 - 69), especially with reference to primitive or traditional cultures it is exactly how the doer reacts when confronted with such limitations, and in view of the fact that materials and natural phenomena already have attained some value, that allows social relations to be objectivated in environmental forms.

Ancient Britons had to travel far (by their standards) to find and collect the stones for Stonehenge, the willingness to fight against nature evidently revealing a certain system of values (Fig. 15). In a similar sense, out of all locations in Greece, ancient Greeks chose Delphi, which they called the navel of the world, as the most sacred location for a shrine representing "a combination of the unconscious with an open-eyed intelligence (Mumford, 1979, pp. 170-198) (Fig. 16). The choice of the particular site has allowed us to understand what their values were both in relation to the landscape and the human mind. (Scully, 1979, p. 4). In his book "House, Form and Culture", Amos Rapoport presents a remarkable body of illustrations as a criticism to the afore-mentioned determinist views. (Rapoport, 1974, pp. 38-72) A similar approach referring to topography, to the limitations that the Greek landscape presents, as well as to how the problem has been dealt with, is offered to us by Kyriakidou-Nestoros (1974, pp. 16-24).

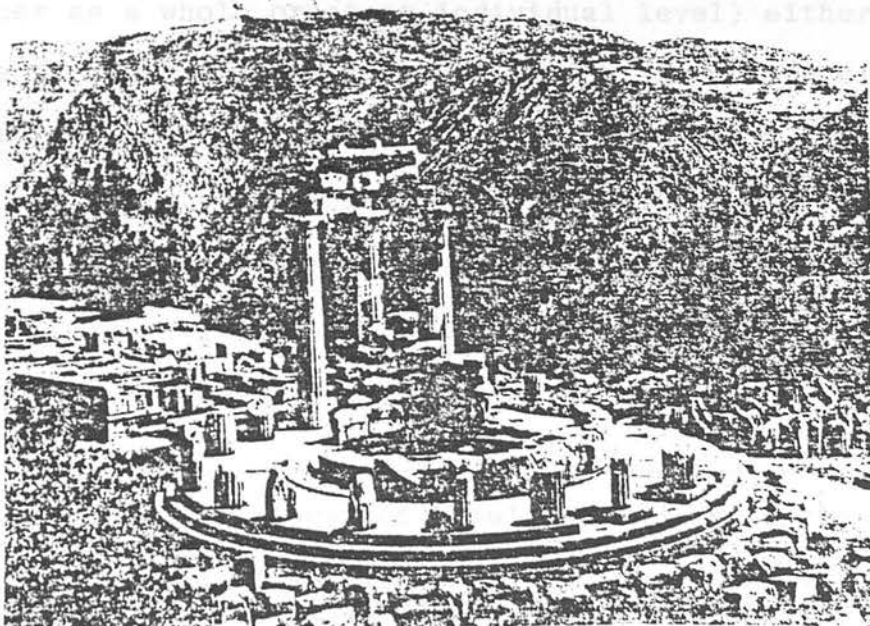
It appears that although the natural environment poses several limitations to the producer of environment, it is mostly how these limitations are treated (and it seems that a certain possibility of choice is often to be expected) in relation to the value invested in natural elements that allows social relations to be represented in environmental forms. Such social relations are referring to the value systems and priorities of the producers in view of the composite need for change and what actually objectivates them is the particular decision taken out of all possible choices. Thus, a Scandinavian



Stonehenge. Not only does the end design obey cosmic rules, but also, for some reason, the site had to be the chosen one while the stones had to be transported from elsewhere.



FIGURE 15



The temple of Athena at Delphi. The valley emerging between the two mountains in the picture provides a breathtaking view.

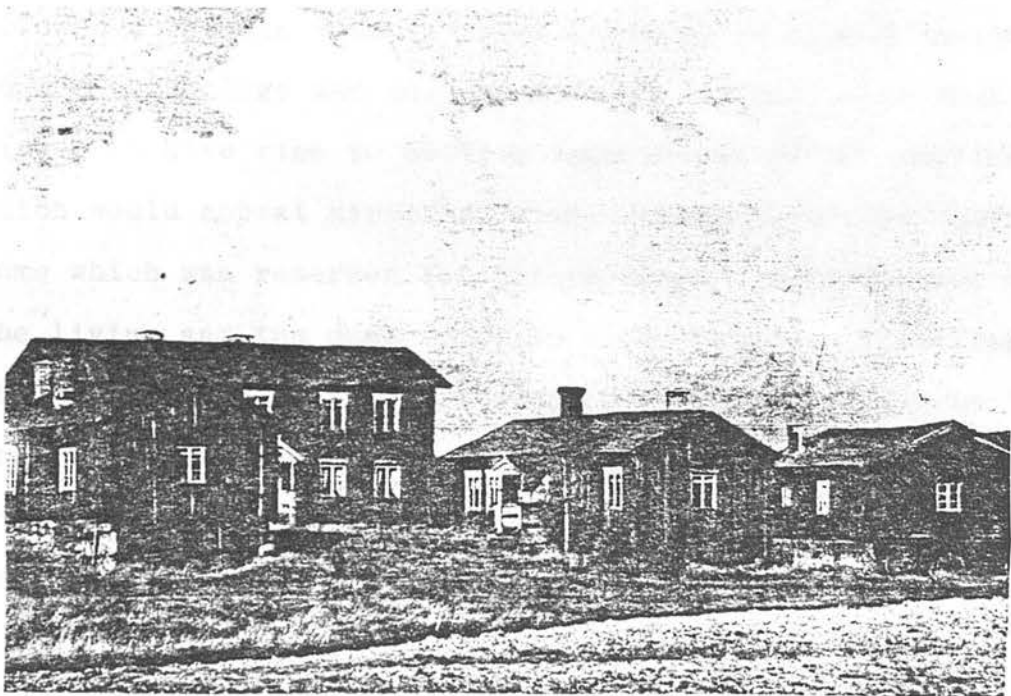
FIGURE 16

timber house may be a natural consequence of the abundance of timber in the land. Yet, since timber is of a certain high value in the world market, such a house would also be a consequence of (and, hence, reflect) the land's economy and the countries' social and economic priorities both today and in the past (Fig. 17).

Similarly, the peaceful and continuous natural phenomenon of the ageing and deterioration of buildings with time (a facet of the natural aspect of the external factor which is often ignored) means different things and, accordingly, is treated differently in different social contexts (Fig. 18). Old buildings, artefacts or settlements do not merely represent the obvious fact of their age. Instead, they are particularly dense in their objectivating of social relations since these social relations comprise those of the societies* that build them, those of the attitudes of other societies that used them and those of today's society (either as a whole or at an individual level) either as a whole or at an individual level) which has chosen either to respect or to ignore them.

A similar degree of choice appears to exist when dealing with the availability of technology, although a recurrent theme in modern architectural theory has been treating technology, as being a determining factor in the production

* Even so, as the level of knowledge and available technology is a function of the particular society, and consequently, an expression of social relations (more direct than value invested on natural elements), this product inevitably portrays social relations in the form of a deep trace left on it by the particular stage society was at at the time.



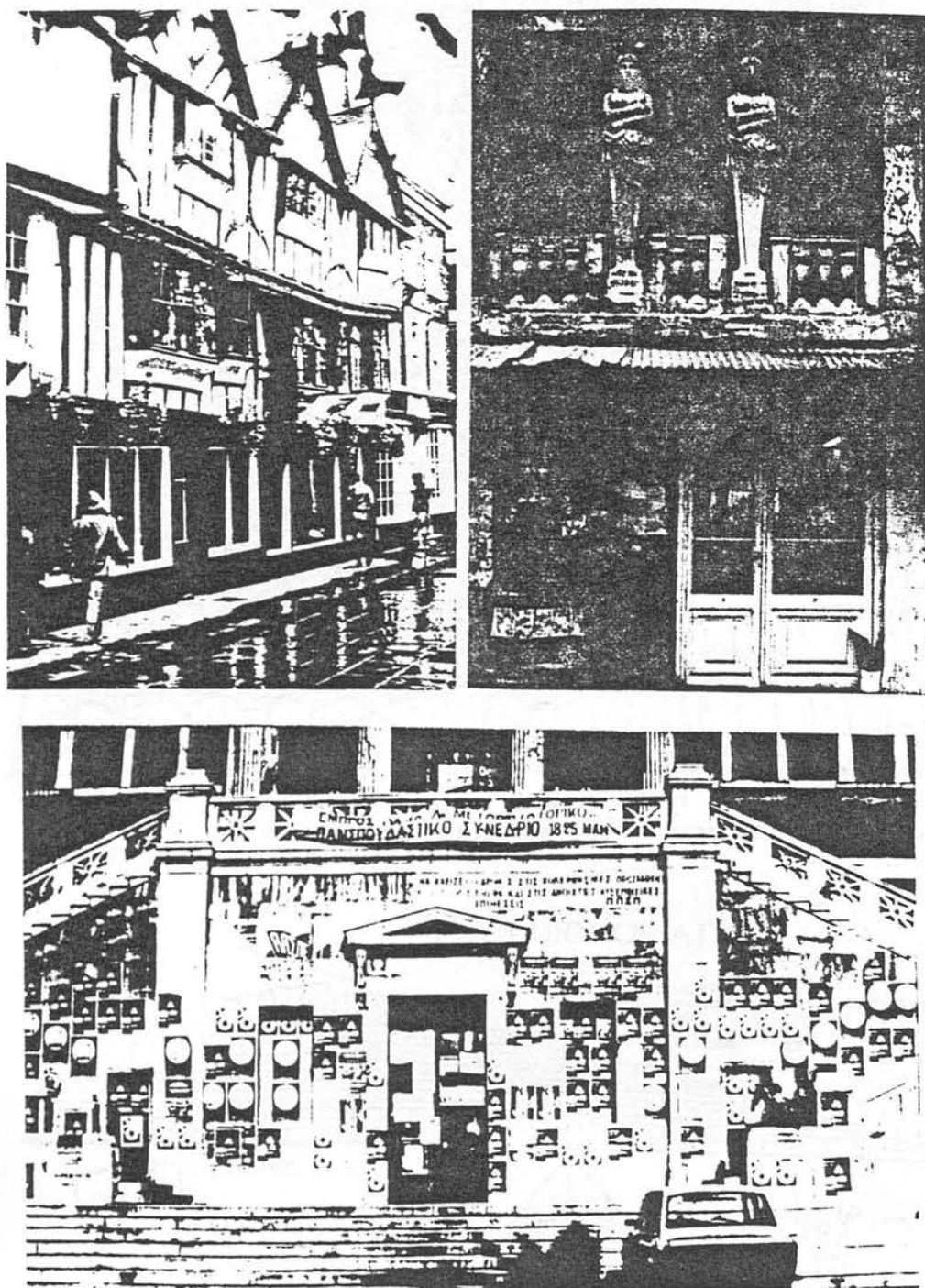
The abundance of timber in Scandinavia and its socio-economic implications registers in a number of ways in the Swedish landscape.

FIGURE 17

of forms. Admittedly, artefacts, which because of their nature had to be based on the maximum exploitation of the existing level of knowledge, were determined to a significant degree of technology. A 15th century map, for example, can not be very accurate due to the inefficiency of geographical instruments at the time and in spite of the designer's and the researchers' efforts (Fig. 19).

In cases where accuracy or specificity is not that critical however, the doer may choose the technical means he wants to arrive at the end product he wishes (Rapoport, 1974, p. 46). Although the ancient Greeks were aware of dome structures, for example, they reserved it for tombs (Orlandos, 1960, p. 393) (Fig. 20). This choice, apart from representing certain social relations referring to this distinction, allowed a certain vocabulary of codes to be formed in respect to the technology and shapes employed. Thus, when they wished to give rise to emotive experiences of the environment which would appeal directly to the unconscious they chose the dome which was reserved for places where the difference between the living and the dead would be accentuated. A similar observation may be said for differences in the employment of the circle, the square or other shapes when dealing with churches, civic or other buildings. (Eco, 1980, p. 26; Zevi, 1957, pp. 187, 193).

As the methodological line of approach in this section gradually shifts from the natural aspects of the external factor to the social one, it may be observed that an increasingly wide body



The way an ageing building is treated is a function of the users' characteristics. The illustrations on top are taken from the commercial centres of York (left) and Athens (right). In the first case, the users tried to make the most of the building by preserving its image while the owners of the Athenian neoclassical building found the absence of strict conservation laws handy and allowed it to decay. The entrance of the National Technical University of Athens, below, is covered in political posters the years following the fall of the military dictatorship in Greece; student politicization was much stronger than any feeling of conservation.

FIGURE 18

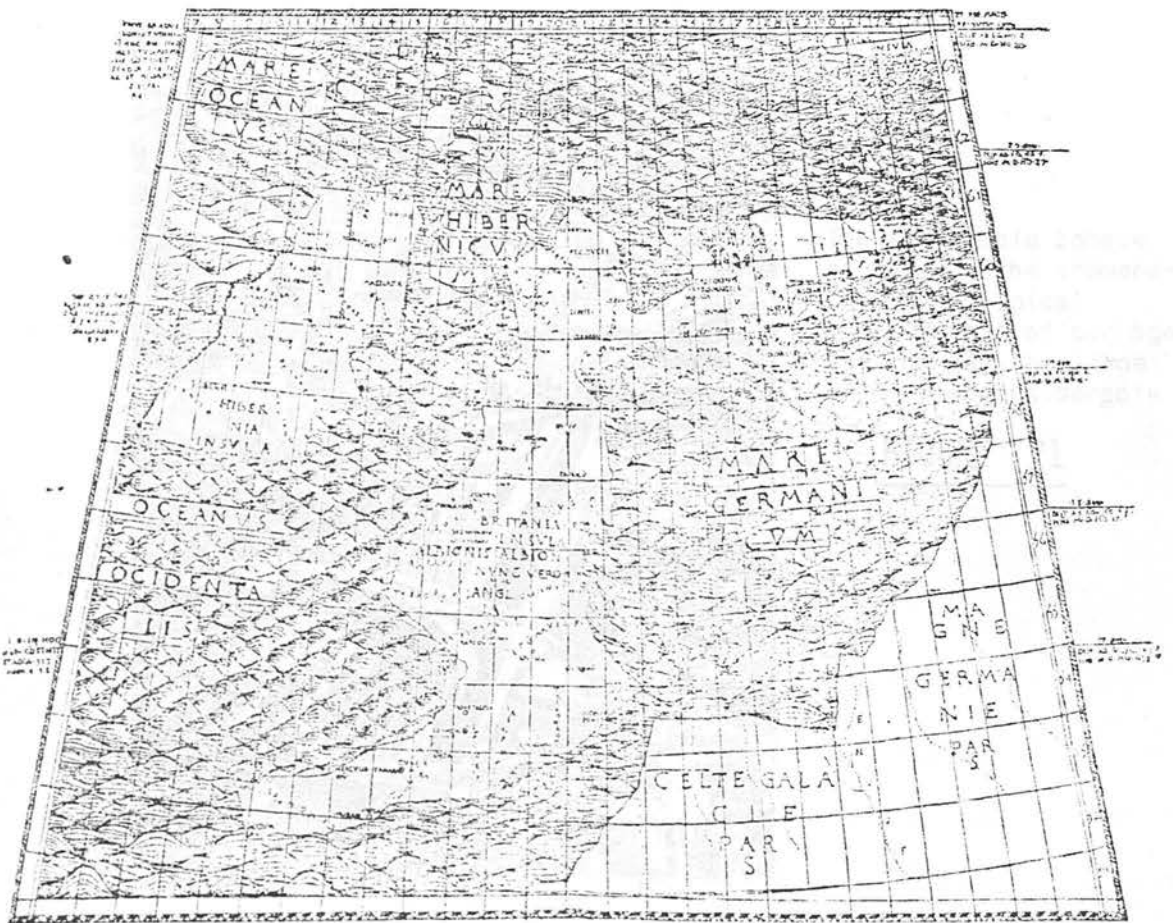


FIGURE 19 The British Isles, in the first printed edition of Ptolemy's "Geographical" with maps, Bologna 1477.

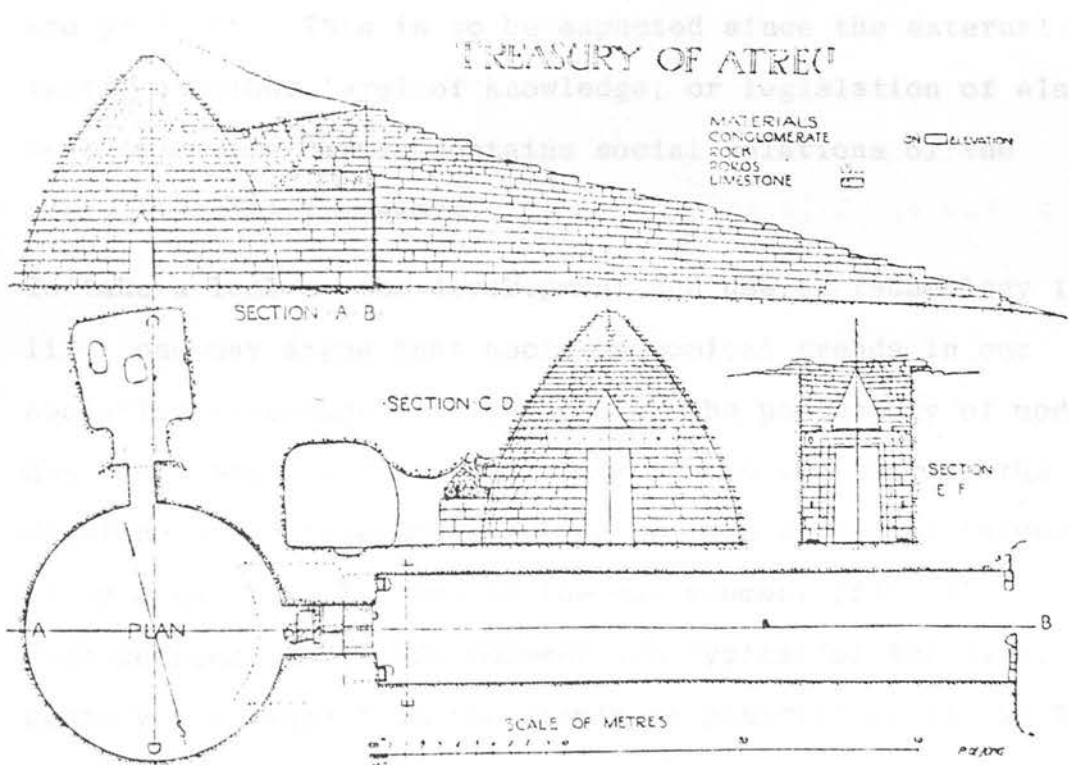


FIGURE 20 Plan and sections of the tomb of Agamemnon (the Treasury of Athens) at Mycenae.



The way people behave as regards the tremendous technological achievements of our age has changed the image of cities considerably

FIGURE 21

of social relations is allowed to become represented on the end product. This is to be expected since the external factor (whether level of knowledge, or legislation of else) because of its nature contains social relations of the overall social framework.

To take a look at the development and use of technology in life, one may argue that socio-economical trends in our societies, together with changes in the psychology of modern man that resulted from them, have led to and sustain the development of telecommunication and are expressed through it in a variety of forms in the environment (Fig. 21).

Such changes in the environment are typical of the twentieth century and range from the prominent positioning of the TV set in modern living rooms to the dispersal of large scale activities, as current trends in population and land use

show. (Holliday, 1977).

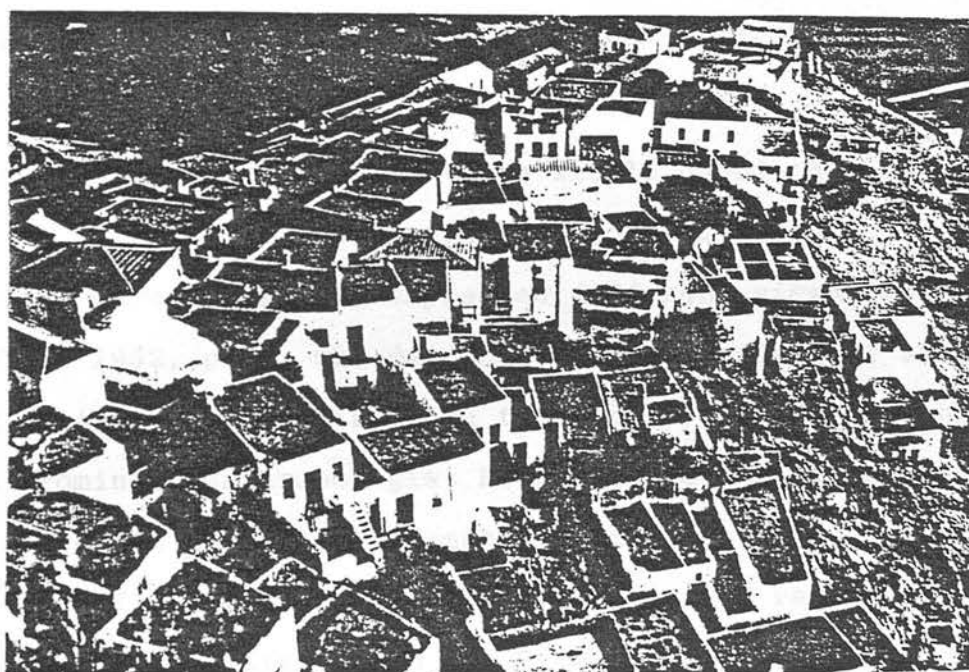
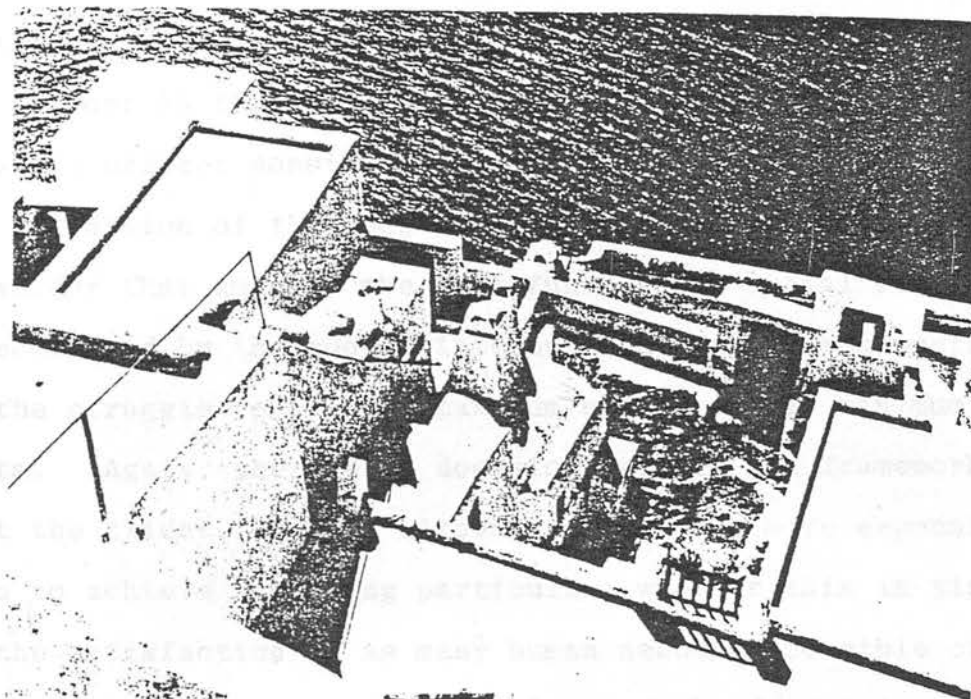
Legislation is another way through which the social context affects building form. Since they are issued to help society cope with problematic situations, building regulations can not help but express a certain philosophy of the social framework. This can be seen both in over-protected areas as well as in cases where state control is practically non-existent; the anarchic Manhattan skyline is the manifestation of the omnipotence of free market forces. (Fig. 22).

Naturally, legislation on building did not always have to be in the rigid written form that has been established today. In societies of the past, people had to follow certain unwritten codes, a product of agreement between villagers through experience over the ages. Rapoport refers to Indian rules in Spanish Latin America, which were concerned with narrow lanes to provide areas of shade, and to Chinese codes in Peking as regards to the hierarchy of the colours used (Rapoport, 1974). In the island of Naxos, in Greece, a traditional code of building regulations set height limits to ensure access to the view, exposure to the winter sun and ventilation for all the houses. Furthermore, it established the practice of floor-ownership, allowing a person to own the ground floor while someone else owns the first floor and still a third party may own the terrace (Polychroniades, 1974). The degree of kinship and the feeling of belongingness that existed in a certain community at a certain time are social relations which managed to register in built form through such common codes which builders agreed to follow (Fig. 23).



The image of Manhattan skyline in contrast to Nash's Park Crescent (top).

FIGURE 22



The view to the sea in Santorini (top) and roofscape in Skyros (below). The massing of houses in these settlements, as well as many others in the Aegean, reflects the bonds which had developed among the settlers when the villages emerged.

FIGURE 23

Another facet of the external factor which poses limitations to the doer is that of the economics of change. As noted above, Alexander considered it to be highly significant in the definition of the composite need (See 1.1.1). It is no wonder that amongst the most fundamental social relations objectivated by the modern international style architecture is the struggle to achieve maximum efficiency at minimum costs. Again, the doer's decision (within the framework that the client, if any, allows) to go for a more expensive form to achieve something particular, whether this is status or the satisfaction of as many human needs as possible or else, will let more social relations of the doers' and users' "physiognomy" and the particular situation mark the end product (Fig. 24).

Furthermore, there appears to be little doubt that culture may be included in the external factor, although several writers have explicitly expressed different views (as f.i. Kubler, 1962, p. 9, who denounced the importance of analyzing culture when dealing with the history of architecture). The prominent anthropologist Ruth Benedict maintained that in different cultures the emphasis may be put in different aspects of life, as for instance, economics, religion, sexual relations, maturity and so on (Benedict, 1952, pp. 15-32). The difference in religious attitudes between our society and medieval society is objectivated in the prominent position of the church in a typical town of the latter period. (Fig. 25). But even within contemporary society, if one takes a closer look at social relations as these are represented in spatial

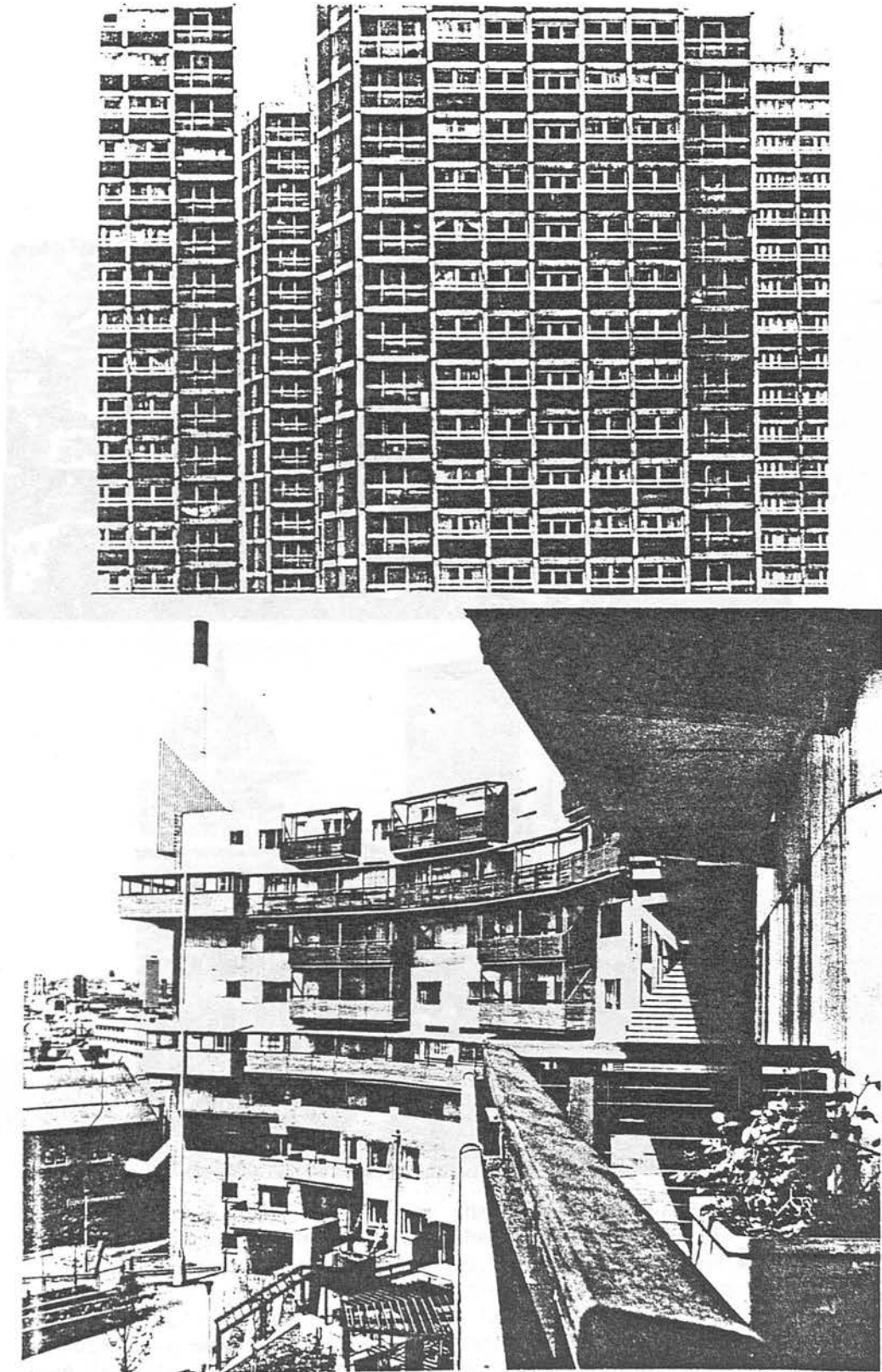


FIGURE 24

In an attempt to avoid building a drab housing estate, like the one pictured on top, Erskine employed his ingenuity along with a mixture of mainly cheap materials and the consultation of the community of Byker, Newcastle (bottom). The result portrays characteristics of both the designer, as he struggled for a good design in view of a limited budget, and the users in as much as they participated in the design by explaining their individual needs.



The fact that il Duomo dominates the skyline of Florence is consistent, on the one hand with the importance of religion at the time the city took shape and, on the other hand with the society's present respect for the country's cultural and architectural heritage. This latter factor, which may perhaps have something to do with tourism, can seldom be seen in modern western environments.

FIGURE 25

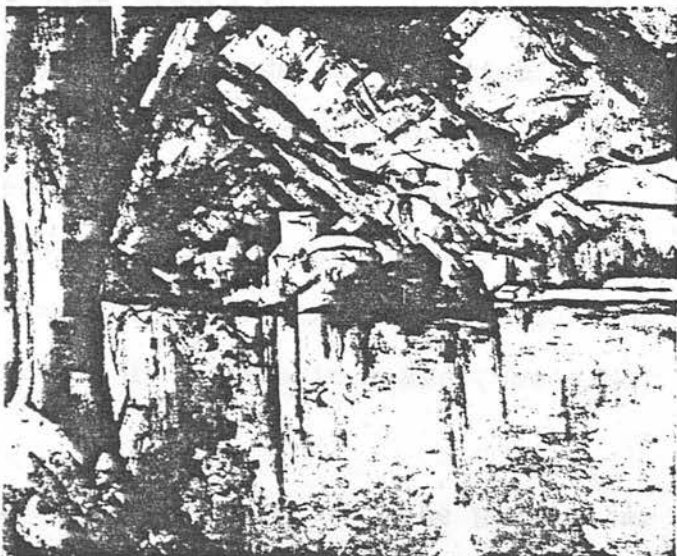
form, one may identify numerous discrepancies (see 1.2.2 and Hall, 1961, 1966). An interesting study of the American bathroom as reflecting the particular society's conceptions of the body, comfort, and privacy has been presented by Kira (1966, p. 7). The way in which the particular doer may react to the socio-cultural aspect of the external factor will be reserved for discussion in the following section.

Finally, it would be an important omission to ignore the effect of the particular conjuncture on the end product. The element of time may act on the production of environment in a number of ways. The continuous deterioration and ageing of built form, and man's reaction to this, has already been discussed. In the present context however, the temporal aspect of the external factor is seen as a combination of circumstances, in the form of synchronicity of events, which occur either before or at the time of production of environment.

Features on environmental objects may be marked by events as varied as somebody's accidental death which left the object unfinished or a change in the ideology trends of a particular society seen as a whole (Fig. 26). For this reason, the temporal aspect of the external factor may be seen as operating as a channel for the objectivation of social relations in a number of ways. When one looks at the whole body of social relations in a particular society at a given time and the influence it may have on production of environment, then one is actually considering the influence of the "Zeitgeist", or the "spirit of time" (see p. 6). There is still a debate among historians as to whether Zeitgeist determines architectural

Reflecting changes in society, and its standards and values, the painter is characterised by different attitudes in the way he regards, on the one hand, natural landscapes, as a point of departure for artistic creation, and on the other hand, his relation to the artefact he produced. In the painting on top, he tries to capture nature within a measured orderly framework ("Landscape with the Burial of Phocion", by Poussin, 1648); in the one in the middle, he tries to represent nature's vitality without losing control of its underlying structure ("Lac d'Annecy", by Cezanne, 1896); finally, he uses nature as a source of plastic forms that can be liberally transformed to fit into his vision of the universe ("Nudes in the Forest", by Leger, 1909-10).

FIGURE 26



production and many writers have adopted a deterministic viewpoint (as f.i. Pevsner, 1979, p. 17).

It lies beyond any doubt that the trace left on the end product by the particular conjuncture (whether this is "the spirit of time" as a whole, or seen in some aspects of it, or a mere sequence of events) may lie beyond the doer's reach; at least, to some notable extent. One may expect this to vary, however, depending on the nature of the conjuncture. In any case, it lies beyond the scope of the present study to adopt a stance as regards the question of the influence *Zeitgeist* may have on the production of environment. In the present context, the interest lies in examining the functional relationships between social relations and form as such rather than coming into conclusions about the type of this influence in a generic sense (see also 1.2.4).

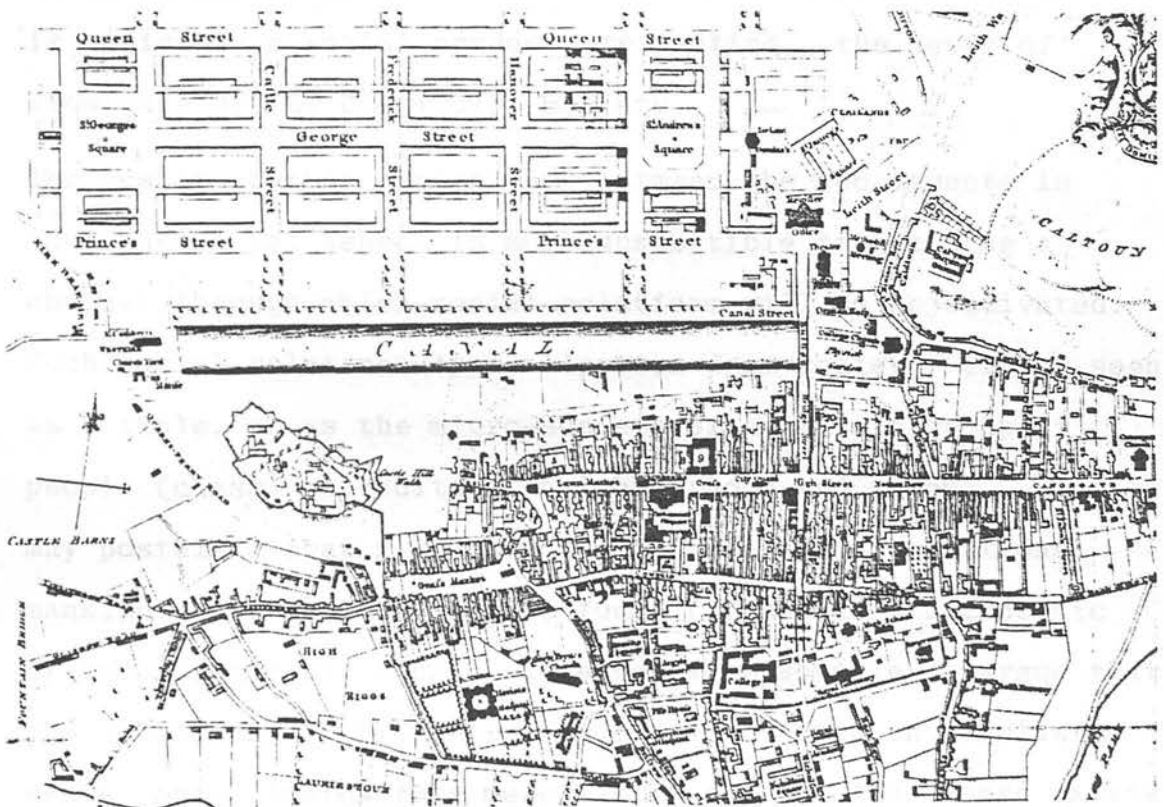
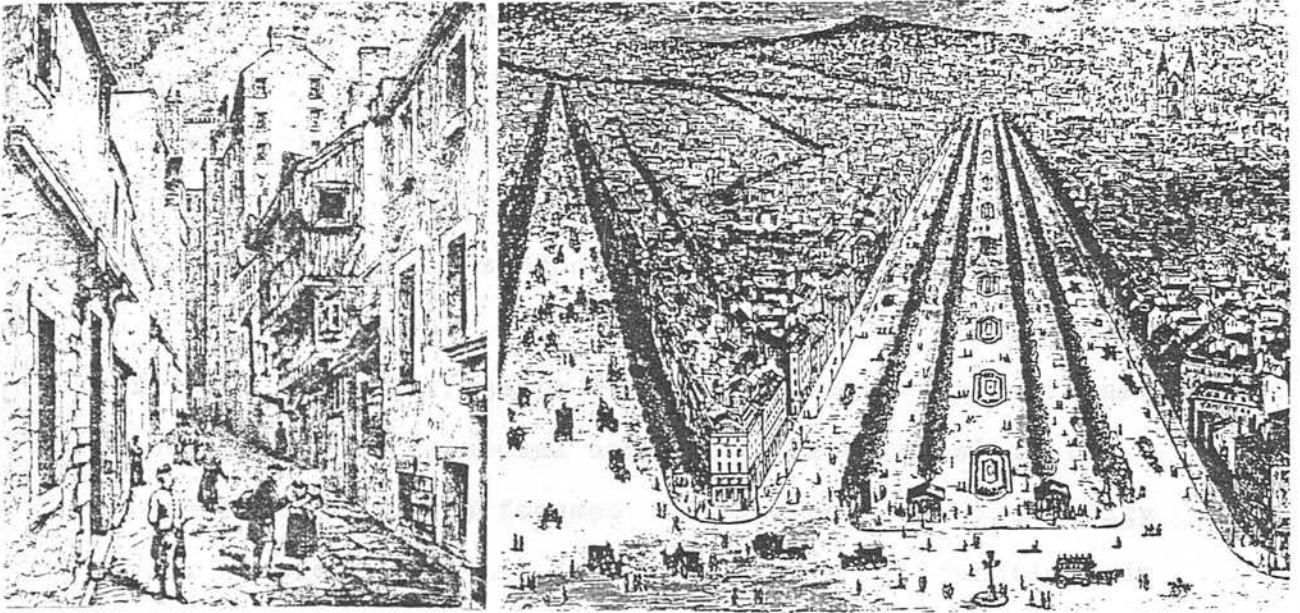
When one looks back at history, the effect that the particular conjuncture may have had on the production of environment often tends to be taken for granted. Environmental change may be largely influenced by established models and prototypes (Rapoport, 1974; Broadbent, 1973, and, especially "iconic" design, p. 418; see also 1.1.4 for the idea of functional fixation). And although everybody would be in agreement as regards this fact, the implications it contains are not always perceived. Such could be the question of why did a particular doer, seen in his socio-temporal context, choose this prototype and not the other, in view of the social relations that each of

them contained; and, carrying the argument further, what options did exist at the time.

The form of Edinburgh New Town in its entirety, for example, was not a mere result of the fact that the aristocracy and the prosperous professional classes wished to improve their living conditions, but it was also influenced by the particular conjuncture and the attitudes of the time from those responsible for design.

Firstly, there was the appreciation, from the part of the social groups interested in the remaking of Edinburgh, of developments in contemporary France and England. French influence led to Craig's inspiration from the development of Nancy which was accomplished in the years between 1751 and 1755 (Adams, 1978, p. 76). It registered on the environment in the form of the general layout of wide boulevard-like streets. As in French architecture of the time, the emphasis is put on the street and the elevations facing it and interior spaces are merely fitted in the overall plan (fig. 27). Furthermore, apart from the ideological influence which England expressed on the Scottish upper middle class, their link with the English was tightened by the events following the 1745 Rebellion. The reflexion of this bond is to be seen not only in street names (Rose Street, George Street, etc.) but also in the kind of living that the New Town was asked to promote and which, as Smout puts it, was like London (Smout, 1969, p. 348).

To recapitulate, it has been examined how the external factor



The drawing above left depicts Fleshmarket Close, in Edinburgh Old Town before the expansion. Living conditions were similar to those in a number of residential quarters in Paris. An exaggeration of the solution adopted for the French capital is given in the drawing above right. Although, in the case of Edinburgh, the problem was treated through expansion and not renewal, the design of the New Town was influenced by the French in many ways.

FIGURE 27

in the production of man-made environment influences the end product. It appears that every aspect of this factor poses its own limitations to the "doer". Natural aspects of the external factor do not contain social relations, only in as much as society has embedded them, whereas social aspects do so by definition. The composite need for change, which refers to the requirements set by the users, can be regarded as belonging to the social aspect of the external factor, if one's attention is focused on the "doer". Technology may be considered to lie in between since it functions as the natural aspect of the external factor would, while it is typically a social product reflecting the level of knowledge of the particular society.

The result of this discrepancy between the two aspects is that the social aspect is more susceptible to becoming a channel through which social relations will be objectivated. Such social relations typically stem from society, either seen as a whole, or as the micro-society of a certain group of people (class, sub-culture, neighbourhood and so on). One may postulate that since behind all such social relations mankind, as a whole, is to be found (either in a diachronic or in a synchronic sense), it appears reasonable to argue that the social aspect of the external factor, seen in a holistic sense, objectivates this mere fact; namely, that there exists a world of man, in all its norms, rules and complexities.

The natural aspect of the external factor is more rigid. It appears that there has to be the "doer's" choice over the limitations he faces so that social relations of his values,

and his construction of the world in general, in relation to the composite need may become represented on the end product. In the case of the social aspect, this element of choice, although always there and fundamentally important, is in a sense diffused in the plurality of social relations which are to be found in the limiting factor itself. Still, in a holistic sense, the natural aspect represents the natural environment; in this case, the raw materials, to which man adapts himself. And these can not do else but be, in some respect, limited whatever the scale of the production of environment.

Lastly, let us consider the features to which social relations channeled through the external factor may correspond to. If compared to the composite need for change (which has been held responsible for generating and setting the standards of the shaping of environmental forms), it is clear that the external factor operates at another level which allows it to influence any of the physical features in the form. It is possible that spatial forms corresponding to the same need for change may appear extremely different, if compared to one another, due to the effect of the external factor. In this sense, it is not surprising that all the deterministic views, as regards the influence of the various aspects of the external factor on environmental form, have been formulated. Since the composite need generates forms however, it would not seem unreasonable to suggest that it is this need which must be expected to be satisfied first - i.e. not necessarily temporarily, but as a matter of importance. It has been shown

hat, while this satisfaction appears like a prerequisite to the production of environment, there will generally be enough room left for social relations to pass through the external factor and mould the end product to some considerable extent and in whatever component of it they are direct to.

1.2.4 The Internal Factor in the Representation of Social Relations on Environmental Forms

To conclude the examination of the channels through which social relations become represented on environmental forms one must consider the influence of the internal factor, (in other words what is channeled through the "doer", or "doers". Apparently, this includes all those who shape environmental forms, whether they design environment at a certain initial stage of its production, or whether they actually construct it. In the present context however, what matters is the person, or persons, who are in control of the form of the end product, at least in its basic and most important dimensions. For this reason, the representation of social relations will have to be seen as being channeled through the designers of environment rather than the executers of instructions in drawings - without this meaning that the latter may not be important in particular cases since they may also add a certain body of social relations in the end product.

Several aspects of the influence the "doer" may have on the end product have already been mentioned in the preceeding sections. It has been shown for example, that certain social relations involved in the shaping of man-made

environment may lie beyond the "doer's" reach. The "doer", then, can not do else than allow these social relations to become represented in the forms he designs. Such is usually the case for the users' or clients' requirements, building regulations and so on.

It has also been noted that, in many cases, there may be a varying number of choices allowed by the external factor. In these cases, a decision is usually taken in two stages. Firstly, the designer brings the possibilities open to him in relation to requirements and limitations presented by other elements of the external factor. After eliminating some possibilities in this manner, he finally makes his decision as to the design on the basis of the remaining ones. While the solution will carry representations of social relations of the composite need for change and the external factor as it has been previously discussed, the element of choice requires further attention since it clearly involves aspects of the internal factor.

Up to this point, the "doer" has basically been regarded as the "bottleneck" through which social relations external to him, pass, so that they result in differentiations in concrete form. To acquire a picture of the social relations which may be objectivated by the internal factor, a different viewpoint is needed: elements from the "doer" seen as a person in his own right are to be taken into account.

Any person in society will typically be based on his prior experience and motivation in life when he considers a problem he faces. Designers of environment who consider design

problems can not form an exception to this rule. For this reason, not only knowledge over the conditions of the problem and the ways through which solution is achieved are expected to vary between different designers, but this also applies to their attitudes, interests and intentions as regards the problematic situation. In a sense, it can be argued that, at least in theory, there will always be a certain personal dimension in the way any "doer" approaches and tackles a design problem. Saussure's distinction between "language" and "speech" (Barthes, 1967, pp. 13-22) can be regarded as being based on the uniqueness of different individual approaches.

This formulation, however, does not necessarily mean that the social relations which sustain this uniqueness will always be objectivated as distinct features in concrete form. Functional fixation as well as similarities in the psychological characteristics of different "doers" may partly be accounted for this. Yet, it appears that there will always be a potentiality for differentiation in form as a result of discrepancies in individual approaches.

The aim of this section is to trace the relationships between social relations of the internal factor and features on the end product. As noted above, these social relations have to do with the "doer's" prior experience of the world and his overall motivation in life and they become particularly interesting when they refer to the problematic situation directly.

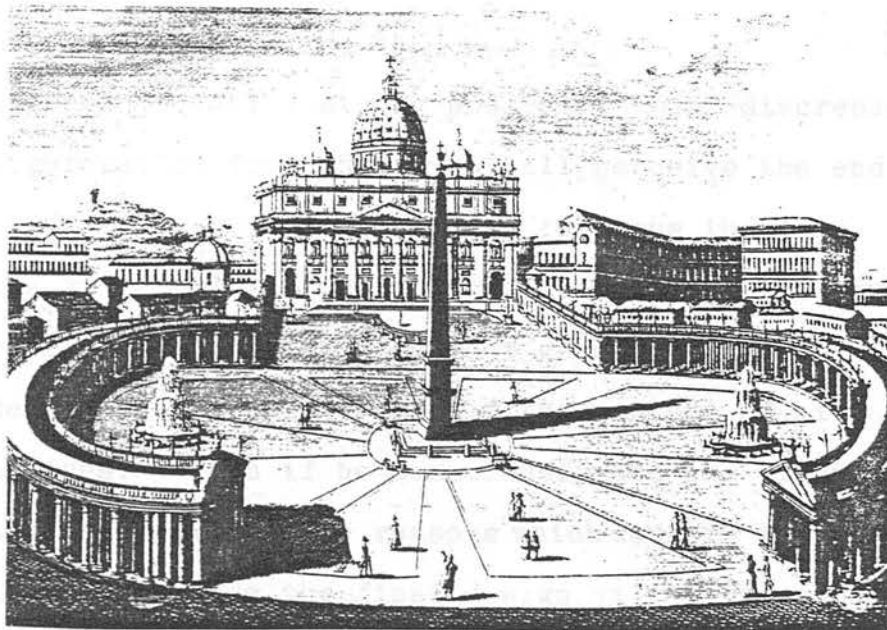


FIGURE 28

In many cases, designers have given explanations as regards their intentions in a particular project. Bernini said that when he designed the Piazza of St. Peter in Rome, he aimed at conveying the image of the mother-like Church embracing Catholics who are united in their faith (Norberg-Schulz, 1980, p. 150). His design objectivated his deep religious feelings as well as his conception of the role of the mother in relation to that of religion (Fig. 28).

The relationship between the internal factor and the end product, however, can not always be easily traced since this search typically involves an analysis of internal processes which may be unknown even to the designer himself. From what has been discussed in the preceeding sections, it seems that social relations, which the designer allows to become represented in his designs, may be notably numerous (if they could ever my measured). Furthermore, as we will later see,

they may even entail a strong possibility for discrepancies in interpretation from those who will perceive the end product. It is reasonable, then, to argue that, in choosing among all the possible solutions to a particular design problem, a designer can not generally be expected to consider the fuller dimensions of the content of all alternatives. Even if he consciously did so, it may be expected that some of the reasons which led him to his decision, as regards the final design, will still remain obscure (Lawson, 1980).

It follows that, because of the nature of the problem, the examination of the representation of social relations on man-made environment through the internal factor will often have to be suggestive in character. Whether they lead to a decision over a number of alternatives or influence the "doer's" expressive behaviour, internal processes may involve complex interdependencies of many social relations. These processes may be so obscure that, in some cases, what is merely identified as the "doer's" personal input in a particular design, may be his identity as a whole.

In any case, a complete investigation of the social relations which become represented on forms by the internal factor appears to be impossible to be conducted. Moreover, as this study is concerned with identifying potential information in man-made environment, untraceable relations between designer and form lie beyond its scope. Yet, the fact that the emphasis in the present context is concentrated on the richness

of the environment's potential informational content appears to ask for an attempt to review aspects of the "doer's" input which tended to be taken for granted.

Bearing in mind the limitations involved, let us now proceed with the examination of the representation of social relations of the internal factor on man-made environment. In view of what has been discussed so far, the act of producing environment can be divided in two fairly distinct stages, as far as the "doer" who is in control of the production is concerned. The first stage comprises the interpretation of the problematic situation and the definition of the composite need for change (analysis) and the second is the process of designing the environment form (synthesis).

The Interpretation of the Situation and the Definition of the Composite Need.

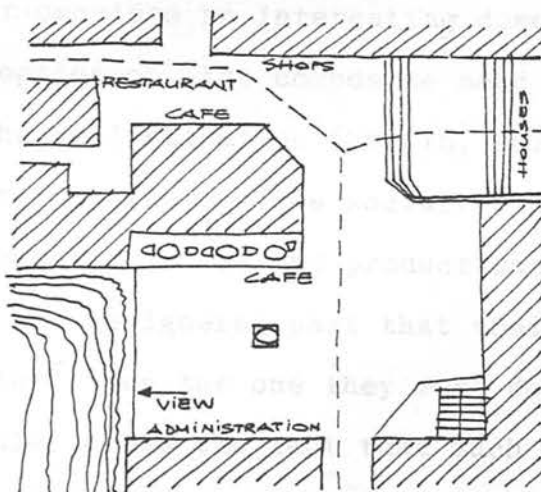
Up to a certain degree, what needs to be done in a situation is dictated by the situation itself. It is only beyond this degree that the individual "doer's" experience and motivation start to interfere. But even within this limited range of their possible interference, the discrepancies between the interpretations of a given situation by different people can be tremendous. An illustration of what can result from a misunderstanding originating from the disagreement between the doer's prior experience and the particular situation has happened in a new housing estate for the rural population in the south of Italy. The toilet bowl (Fig. 29) was being used as a cleaning tank for grapes; the peasants suspended a net inside the bowl and then flushed water at the grapes

until they were clean (Eco, 1980; Jencks, 1980). The fact that the "doer" was unaware, or ignored the peasant's understanding of the world, as well as the fact that the peasants showed notable plasticity of cognitive schemata by converting the unknown object in their bathroom into something useful, were objectivated by the end product (toilet bowl and net). It appears that the definition of the composite need involves more than subjective value judgement, as it has been argued (Lawson, 1980, p. 90). Whatever the degree of necessity in the particular situation, its interpretation has to undergo (both consciously and unconsciously) the "doer's" prior experience and motivation. Hillier's idea of "pre-structuring" the problem can be seen as being involved in this (Hillier et al, 1972). No action is to be taken before the function of the definition of the composite need is completed to a satisfactory degree, in so far as the "doer" is concerned.

In the main village of the island of Kea, in Greece, the steeply rising major street curves into a well-kept square, with a statue in its centre, one side of it offering a very good view of the village which spreads over the hillside (Fig. 30). The whole image gives rise to the thought that two or three houses were knocked down, by a recent decision, to form this space. Despite the spectacular view, the square is left empty of people who do not even use the chairs of the nearby cafe. Instead, they congregate around the corner of the approach street where some steps lead to the other side of the village. Some sit on top of the steps and some on chairs facing



FIGURE 29



Kea, Greece. The square (above left), the view from it (below) and villagers sitting on the steps opposite to the cafe (above right).

FIGURE 30

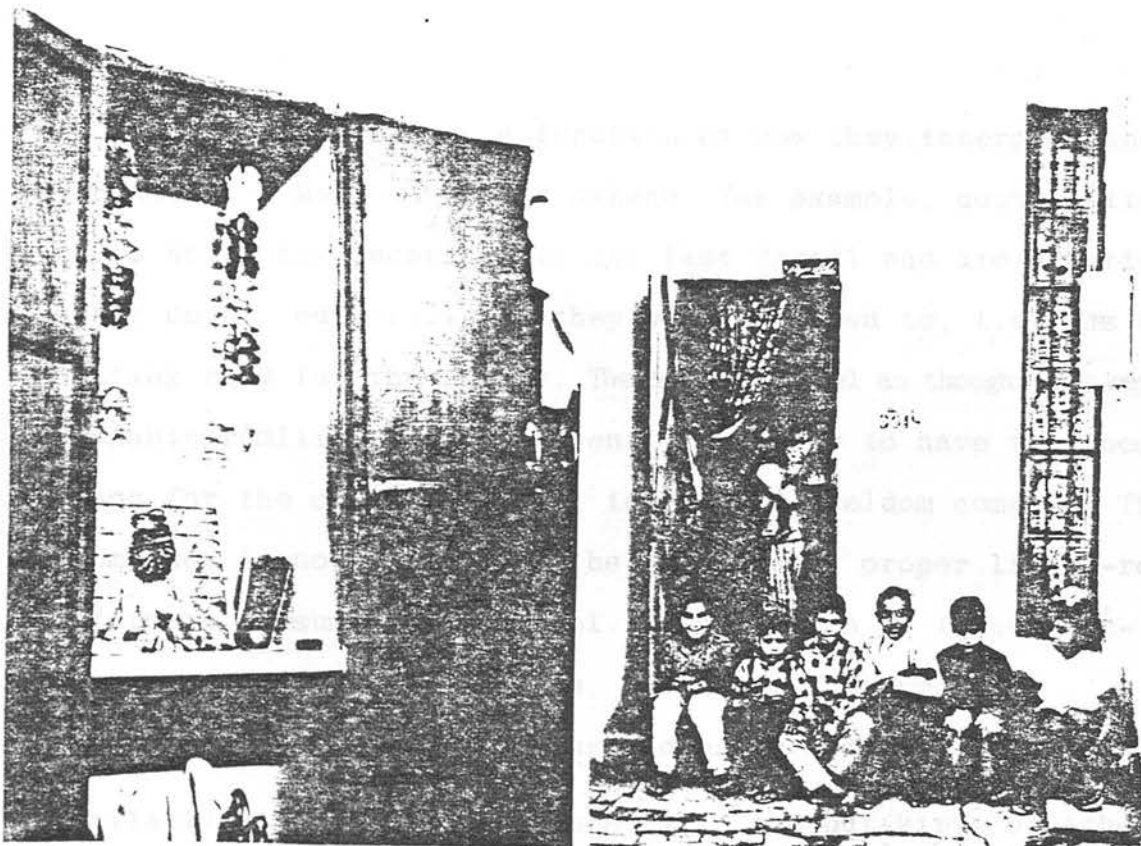
the street. They are not interested in the view offered from the veranda of the cafe on the square but in observing movement and activity and socializing with passers-by. The way the beautiful, but unnatural in this context, open space is used reflects the misinterpretation of the need for change by whoever decided to build the square - presumably a higher administrative official with little contact with the village.

In Chandigarh, and especially the commercial and housing quarters, this was made very evident (Hall, 1966, p. 101).

Brolin provides an interesting description of how the designers' conception of the composite need would not suit the demands of the real situation (Brolin, 1976, pp. 88-103) (Fig. 31).

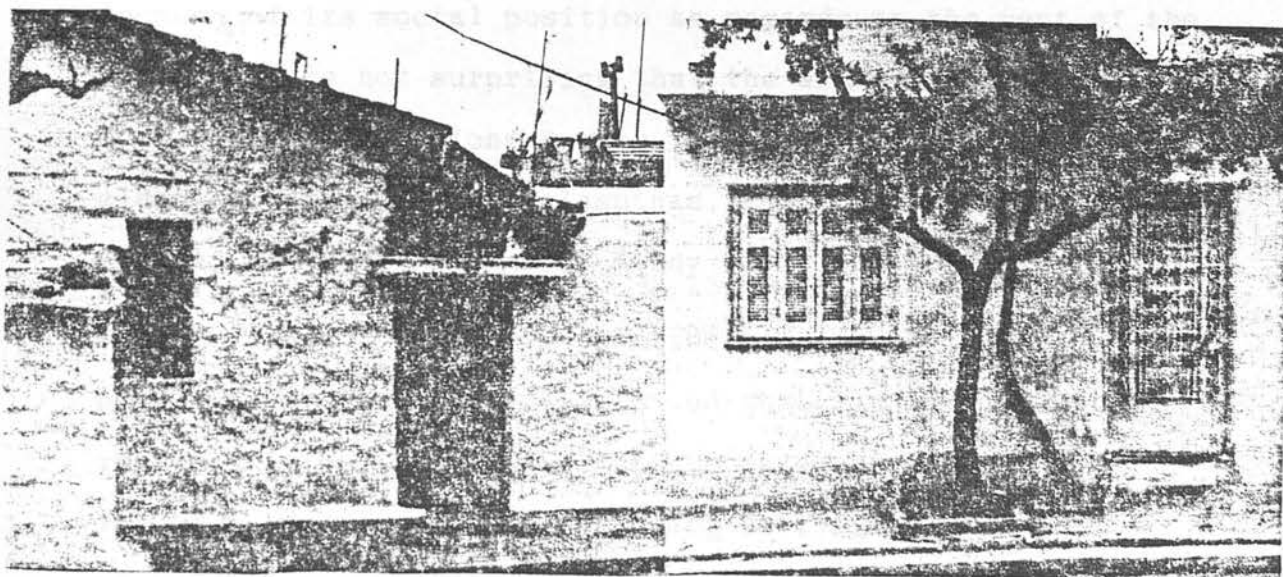
Apart from the obvious social relations, what was further represented in the end product was the implicit insistence from the designers' part that their culture was to an extent "better" than the one they were designing for. In addition to this, comes the fact that such misconceptions may occur of the scale of this project which obviously involves a lot of responsibility. Maslow has suggested that coping behaviour (that is: purposive behaviour) is generally conscious (Maslow, 1970, p. 132). Bearing in mind that the designers were probably educated according to the functionalist principles (design methods as such were introduced later), it must be very difficult to suppose that they were unaware of the functional implications of their end products - especially so, from the layman's point of view.

One does not have to go very far though. The way people dress, the way they decorate their living-rooms or their front gardens



A number of the users' needs were misinterpreted by the designers of Chandigarh. The lack of provision for a place for the family shrine forced the Indian family to use the closet (left). In the same sense, windows, such as these at right, are sometimes papered over to assure privacy in the house.

FIGURE 31



The house on the right employs elements which are taken from middle-class houses (elaborate front door in metal, French shutters for the windows, orthogonal overall design in smooth finishing) and, by doing so, it attains an authoritative image that does not easily blend with the street, and the district in general. Most of the houses in the district are like the adjacent one on the left of the picture.

FIGURE 32

is, among other things, a function of how they interpret their own needs. Many houses in Athens, for example, contain living-rooms which are decorated to the last detail and are practically never used; especially as they were supposed to, i.e. as a sitting room for the family. The occupants feel as though they were sociable families and consequently they try to have the room ready for the occasion which, in reality, seldom comes. The room then is not actually to be "used" as a proper living-room, but to be consumed as a symbol. In as much as it concretizes a certain kind of status, its mental consumption revitalizes this notion in the occupants' minds.

Similarly, in squatter-settlements in the outskirts of Athens and Salonika, it is common practice to decorate the external appearances of the houses using as many and as varied techniques as possible. Research has shown that squatters loath their neighbourhood and they tend not to identify with it basically because of its social position as regards to the rest of the city. It is not surprising that the architectural elements most widely used belong to the vocabulary of a typical middle-class suburban house (Malaspinas, 1981, see also Duncan and Duncan, 1976, for a similar study in Hyderabad) (Fig. 32).

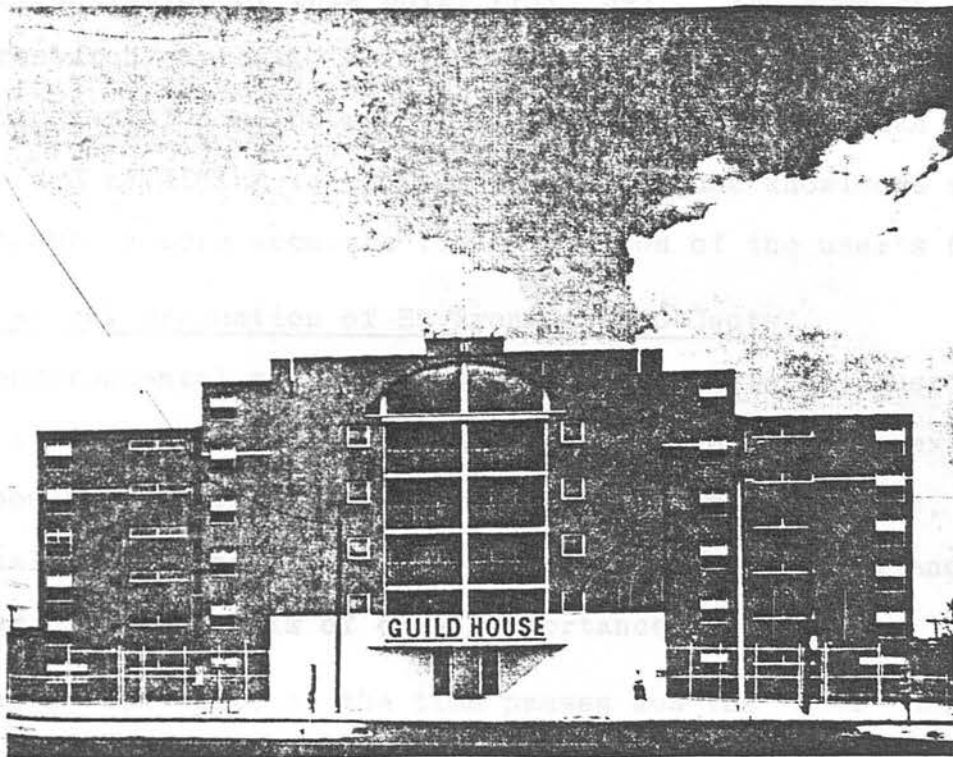
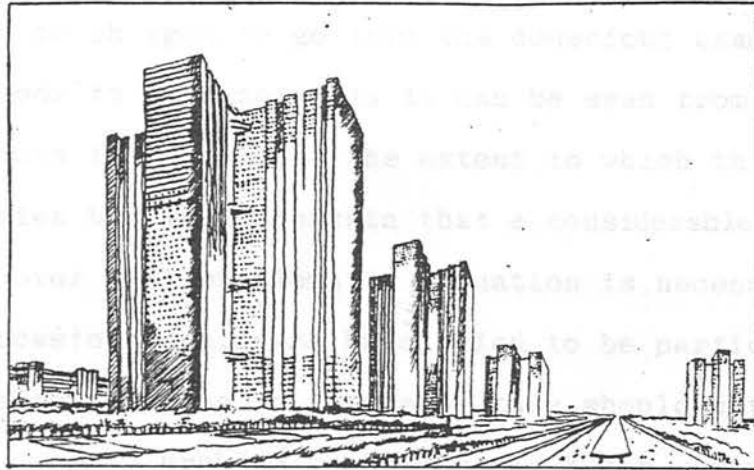
Whether "doer" and "user" coincide or not, the "doer's" past experience and motivation and their influence over the representation of social relations on environmental objects throws the additional light needed to complete the picture of "social relations and the composite need"(1.2.2.)

As it can be seen in the above illustrations, in cases of non-institutionalized production of environment, in which "user"

and "doer" coincide, the end product may give a fairly accurate idea of the person's needs and social and psychological characteristics.

As the designer approaches the problematic situation, his attitude towards it, in relation to his overall motivation, may be regarded as entailing the potential to widen the composite need for change which originally referred to the users. The "doer's" personal needs may mix with the composite need so that the end product is required to function at an additional level. In this sense, when a designer is to build a house, it may be essential for him that the design of the end product enhances his reputation as an architect. And, although this need does not necessarily always result in drastic changes in the features of the final form, in some cases, it may indeed do so.

When a designer sees himself as being part of a particular movement or as criticizing certain trends in design, then the need to come to a definite statement may appear as important as the original composite need for change. Many architects, such as le Corbusier or Venturi (Fig. 33), clearly saw their work as functioning at this level (le Corbusier, 1947; Venturi, 1977). This observation however is not meant to be an underestimation of the role of design artefacts in enriching and changing the language of architecture, but is merely pointing at the fact that there may be additional needs which the end product may have to satisfy and these stem from the "doer".



In many projects, such as "the City of Towers" by le Corbusier (above) and the House for the Elderly in Philadelphia by Venturi and Rauch (below), there has been a particular intension, from the designers' part, to objectivate their views on the theory of design. Later, both le Corbusier and Venturi used the above designs to illustrate their intentions.

FIGURE 33

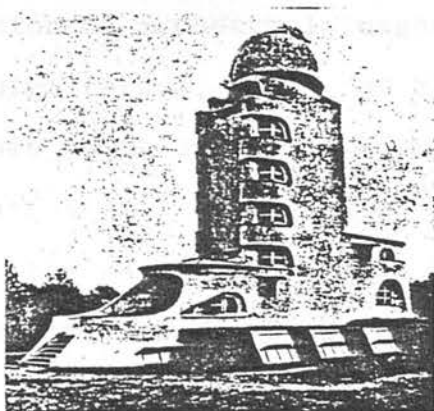
In the process of identifying the composite need for change, the "doer" is obliged to go into the conscious examination of what needs to be done. As it can be seen from the illustrations listed above, the extent to which this may happen varies but it is certain that a considerable degree of awareness over the problematic situation is necessary. In several occasions designers have tried to be particularly perceptive in relation to the needs they should satisfy. To a certain extent, Erskine's attitude in Byker may serve as an illustration of this point (Fig. 34). The growing body of research currently being conducted in social and environmental disciplines with reference to design can be regarded as aiming to provide the background knowledge needed to ensure a more accurate identification of the user's needs.

The Actual Production of Environmental Objects

An environmental object is never created magically just at the time that somebody has identified a need for its existence. Although the definition of a problem is very important, the actual implementation of its solution (both in space and on paper, if needed) is of equal importance.

We have seen that, as the time passes and the "doer" concentrators further on the problematic situation, he discovers an increasing number of tangential "by-needs". At this stage, while he is making up his mind upon considering their relative significance, an image of what the end form may be starts to loom up in his mind (Hillier et al, 1972) (Fig. 34). Such an image usually starts from specific yet random elements and ends up as a whole. These two generally go together and

demand a compromise*. At this point, he starts disentangling himself from the dominant problem of analyzing the composite need and enters the field of synthesis which conceals new qualities. Evidently, analysis and synthesis do not generally carry a temporal gap between them. However, we can consider them as two fairly distinct functions which are in a complex way complementary to each other; the main bulk of the first (i.e. analysis) precedes the second whole.



Einstein Tower in Potsdam, built in 1920-21 by Eric Mendelsohn (now destroyed) and an original drawing by the designer revealing his somehow sculptural approach.

FIGURE 34

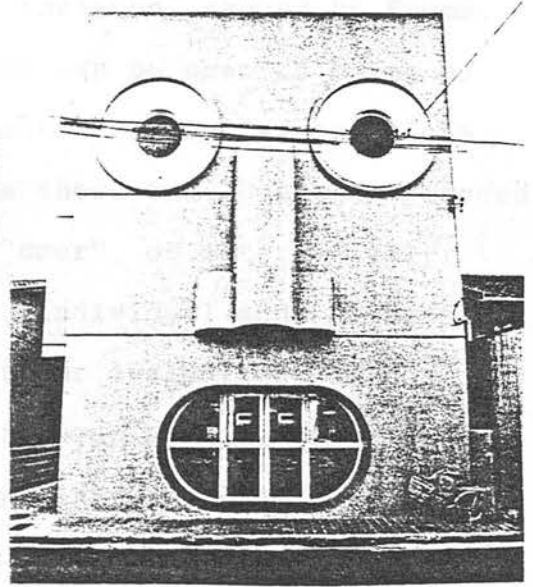
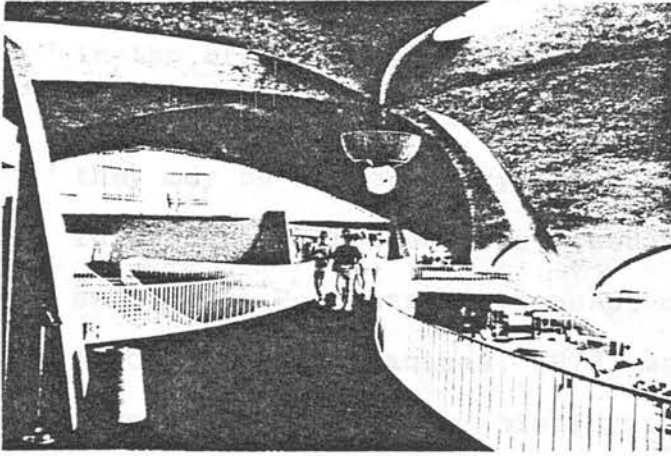
* As noted before, this generally tends to follow certain existing models or prototypes or ways of compromise and so on. Citroen designers however, claim that they design in a "tabula rasa" state of mind (Schmittell, 1975, p. 61). What they mean is, that they attempt to do so basically in as much as models or prototypes of car designs are concerned (see Barthes, 1981, pp. 88-91, for an appraisal of their design).

It is in the process of synthesis that expressions of the user's personality are allowed to come to the surface.

The reason is that, at this stage of the production of an environmental object, the centre of gravity of this process is shifted from "need arisen and the overall objective situation" to "individual who expresses himself". To a notable extent, this behaviour may be an unconscious function (Maslow, 1970; see also Goffman, 1969). As Jung has argued, creative processes involve the unconscious activation of archetypal images and their integration in the design (Arndt, 1974, p. 271).

From this point until the form is finally produced, the centre of creation will basically be the "doer" himself. As noted before, the way he will treat the composite need for change and the limitations of the external factor, as well as the way he will choose between alternative solutions to "by-needs", will be a function and, hence, reflect personal characteristics. In this sense, social relations from the composite need and external factor may always entail the possibility of being intentionally or unintentionally paired with social relations reflecting the designer's "comments" on them (Fig. 35).

The question that arises at this point is: to what extent does this input, which up to now we have regarded as personal, stem from the "doer" himself, and to what extent does it reflect knowledge, beliefs or values of a broader social group, perhaps society in general. If the relationship between the individual and society is to be taken as a two-way relationship in which there is a reciprocal interaction



Above left: Interior of TWA Terminal at Kennedy International Airport, by E. Saarinen, New York, 1962.

Above right: Face House, by K. Yamashita, Kyoto, 1974.

Below: Tucker House, by Venturi and Rauch, Katonah, N.Y., 1975.

One cannot expect that the bird-like or, for some, womb-like design of the terminal, the obvious metaphors employed by the Japanese architect or the original blending of disparate codes by Venturi and Rauch have been dictated to them by the composite need or the external factor. Yet, they are added to the potential informational content of the end products as the designers' comments on the ideology of the functions.

FIGURE 35

between its two elements (as, for instance, argued by Fromm, 1955), then the "doer's" expression can be seen as being of two kinds: they may either originate from social relations in the broader social framework as these have been experienced, "digested", and sustained by the "doer", or alternatively, they may be his own very personal, individual and, perhaps, idiosyncratic reflections, thoughts or evaluations on the subject. Poulantzas's concept of "people being carriers of ideologies" (Poulantzas, 1973) may serve to illuminate the first leg of the above distinction. These shared ideologies may range from beliefs and values limited to a small group like a family to the Zeitgeist seen as a whole or in some aspects of it referring to certain issues. In this sense, social relations from a broader social framework do not only become represented on environmental forms through the channels of the external factor but also through the "doer" himself.

Since the "doer's" personal comments are themselves bound to reflect certain ideologies it appears that the boundaries between societal and purely personal input are not clearly set. In a strict sense, the latter is limited to the way the totality of the "doer's" attitudes, beliefs or comments are expressed in the particular way the physical characteristics of the end product are organized. Therefore, apart from examining how particular social relations, channelled through the internal factor, become represented on environmental forms, the above distinction can be helpful in a different sense: it elucidates how the designer's personal input (when

taken as a whole as described above) is linked to the evolution of systems of expression.

Styles both in technique and in principle of design, although they originate from several people simply following the same principles (which at the time might have been representations of the very personal element of the internal factor), have the general tendency to become almost institutionalized standards (See 1.2.2 for Models or Prototypes). People may consciously or unconsciously follow them until the time comes when their connection with the social framework loses its grip, generally due to the evolution of the latter. At this stage they slowly start disintegrating, not being able to express the new situation adequately. In parallel to this, and depending on the broader socio-economical conditions, other individuals may manage, by stretching the personal element to its limits, to disentangle themselves from these established standards and set the pace for new ones. The history of the use of codes in architectural design, can be regarded as evolving in a similar fashion (Bonta, 1979; de Ventos, 1980, p. 181) (Fig. 36).

The same can be seen as applying not only the systems of expression such as painting, fashion or architecture but also in the case of systems of thought which are not directly objectivated (f.i. philosophy, political or economical theory etc; see, for example, Kuhn, 1970, for the role of "paradigms" in the evolution of scientific thought).

Casa Mila, by Gaudi,
Barcelona 1905-10.

Middle: Steiner House by
Loos, Vienna, 1910.

Bottom: Villa Savoye, by
le Corbusier, Poissy,
1928-31.

When, at the turn of the century, a new conception of architecture was needed in Europe, the personal input of Art Nouveau designers, such as Gaudi did not meet as many followers as that of innovators such as Loos and le Corbusier did. The abstraction, lack of ornament and emphasis on the "house-tool" concept propagated by functionalists fitted well into the socio-economic requirements of western societies.

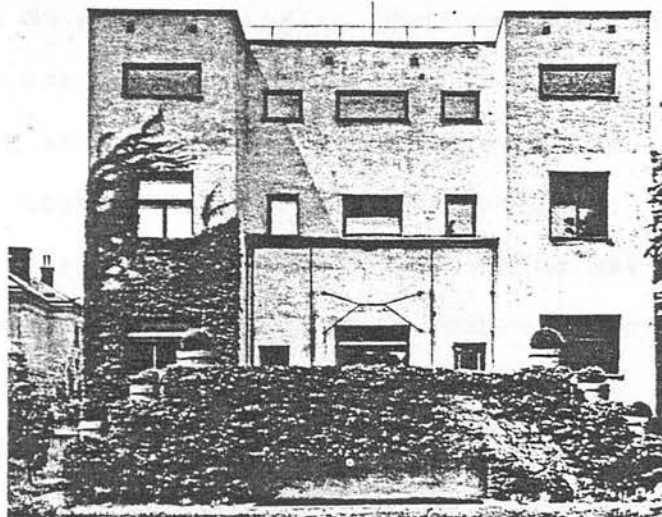
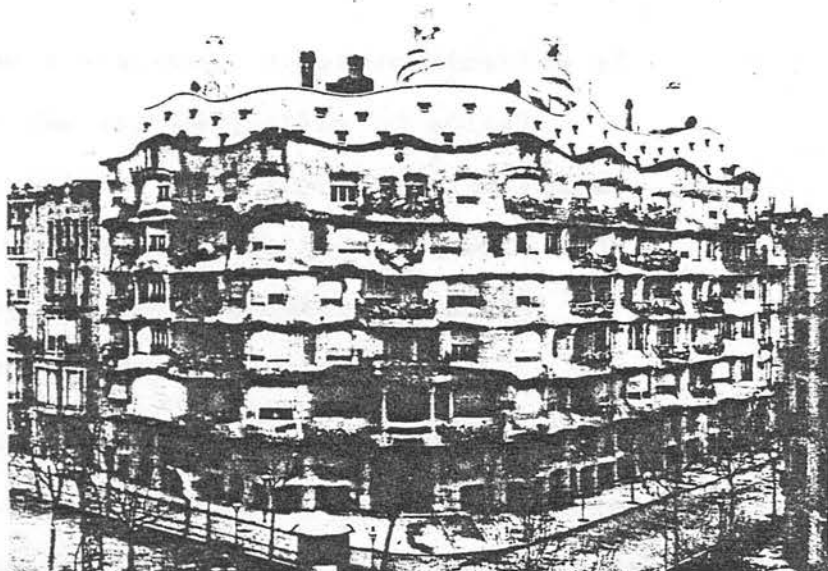


FIGURE 36



This is not meant to be a statement of overestimation of the internal factor in the representation of social relations on environmental objects, since the individual will always operate within a given social framework and under the restrictions of a given situation and the requirements of a composite need.

The distinction between societal and personal input during synthesis also gives a good explanation to several large-scale environmental changes. We said that the individual "doer", in the process of syntheicizing an environmental form, objectivates a certain set of social relations from the social framework (along with his criticism on it). The consequence of this is that, on a more general level, collective activity by carriers of similar ideologies may lead to a more depersonalized and, perhaps, clearer objectivation of particular social relations on the level of sociology.

An illustration to the above can be given by de Ventos's explanation of "the transformation of the objective-idealistic Hellenic style into the effectivist, illusionist Roman style of architecture". In "Rome", he says, "the formal Greek repertory is used but its syntactical organization varies. Its elements are no longer used for their objective value, but for the effect they are able to create in the observer. They think now in terms of the consumption of the monuments: monuments that are able to be perceived from a great distance. And the reason is obvious. Roman buildings and banners have to speak now, not only to a polis of cives who share its code, but to the barbarians in Gallia or in Hispania who are

controlled by the *ius gentium*, who are entertained by the spectacles and who are impressed by the imperial 'image'. Its style has to be, then, more clearly decodable, more effectivist and more symbolic. Since its message must travel very far away, classical forms are transformed into Roman symbols. The quantity - distance in this case - makes the quality." (de Ventos, 1980, pp. 186-7, his emphasis) (Fig. 37).

It is unlikely that anyone will maintain that this transformation of classical forms into Roman symbols was a consequence of an "act of will" at a given time. Instead, it is more probably that designers or decision-makers, or both, felt the changing social framework (the increasing power of Rome) gradually. In this process, consciously or unconsciously, they made the context's requirements possible by producing more decodable and more symbolic forms*. Consequently, designers and decision-makers in Rome succeeded in objectivating basic social relations in the existing social framework (the consumption of images, the magnitude of the empire, education of the peoples it contained etc). It appears reasonable to suggest that this objectivation was made possible by the fact that they had "digested" the philosophy of what it means to be a member of an empire, this fact being objectivated as well.

* It is interesting to note how this particular analogy is reflected in other systems of expression of the Roman culture. It has been noted, for example, that Seneca's tragedies, which were adapted from the Greek, showed, amongst others, an excess of declamation (Harvey, 1969, p. 390).

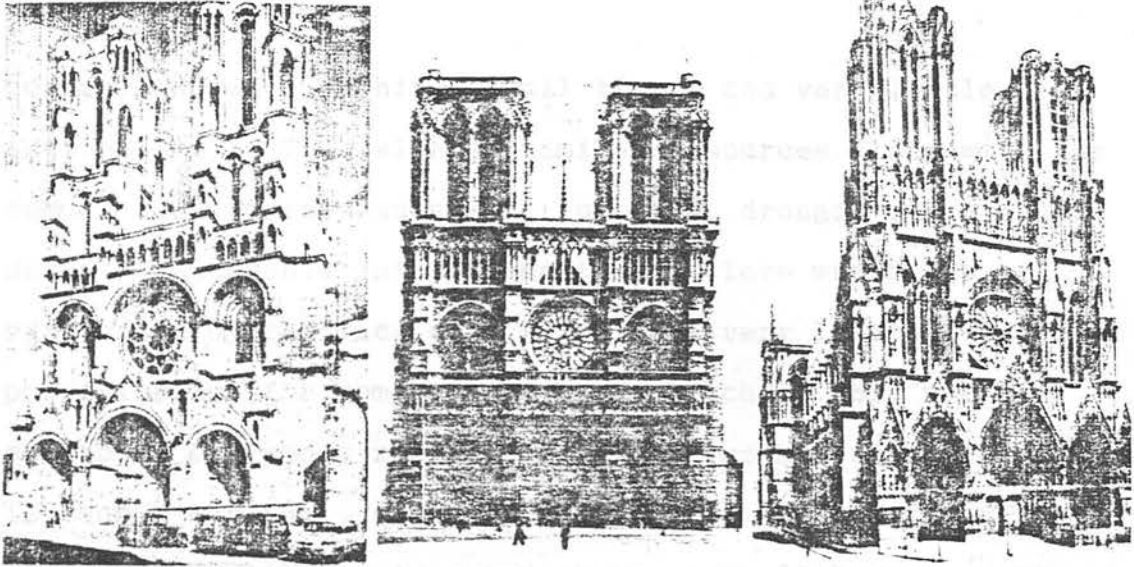


FIGURE 37

In his book "Gothic Architecture and Scholasticism", Erwin Panofsky offers a fascinating, if not convincing, explanation for the solution of a problem posed to the architects of High Gothic Cathedrals (Panofski, 1957, p. 674). In incorporating the rose window in the western facade of the cathedral, the designers appeared to have to choose between two distinct possibilities of a solution: they could either inscribe it in a square, or they would have consistency in the horizontal and vertical lines in the facade. The dimensions of the rose window in relation to the central vault did not allow them to have both. "They were faced with two apparently contradictory motifs, both of them sanctioned by authority, one could not simply be rejected in favour of the other".

But as Panofsky explains, they were heavily influenced by scholastic argumentation at the base of which lies the doctrine of reconciling the seemingly irreconcilable. It appeared that things had to be worked through to the limit and to be reconciled in the end. And, after a series of attempts (in the construction of the cathedrals of St. Denis, Notre-Dame de Paris, Mantes, Laon and Amiens) they finally arrived at the solution needed in 1240-1250 in the cathedral of Reims. "The rose was inscribed within a pointed arch of a huge window, thereby becoming elastic as it were" (Fig. 38).

Panofsky does not state whether the architects of these cathedrals were consciously seeking to apply the philosophical doctrine in their work or whether they were that much influenced



The Cathedrals of Laon (1160-1225), Notre-Dame de Paris (1163-1250) and Reims (1211-1290). In the first two, the dimensions of the rose window caused certain asymmetries in the west facade, especially in regard to its horizontal lines. The problem was solved in the third case, the Reims Cathedral, which is considered to be one of the finest examples of Gothic Architecture.

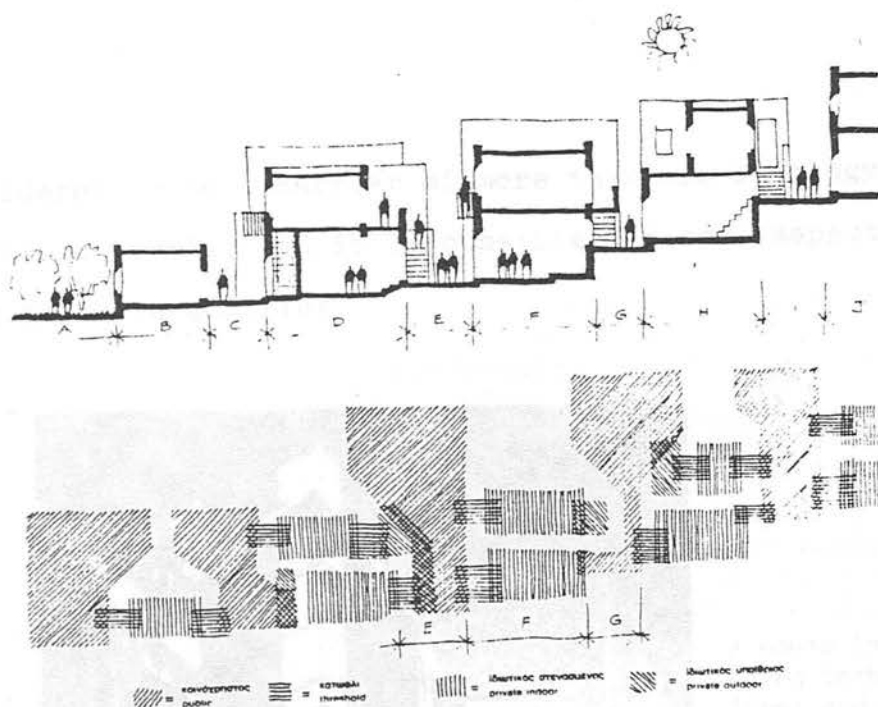
FIGURE 38

by scholasticism that it had penetrated in their unconscious way of approaching problems. In any case, if his explanation reflects what really happened, then the dominance of the particular philosophy in people's minds was objectivated in concrete form by the particular solution and the preceding quest for it. Furthermore, the successive different solutions given to the problem were the designers' personal input and reflected their particular attitude in respect to this aspect of the composite need and the existing ideology. A third illustration shows people sharing common basic ideologies which are replaced by different ones, when changes in the social framework occur. It concerns Aegean island settlements. When these were first built in the form that we roughly see them today (14th, 15th century AD) their settlers'

occupations were fishing, small trade, and very little agriculture. The islands' limited resources along with the common fear against adversity (pirates, drought etc.) produced a remarkable unity among the settlers which was reinforced by the fact that there were very limited possibilities for somebody to become rich. This unity shared by everybody represented itself on environmental form in such a way that, although no house is prominent, no two of them are alike. As noted above, most villages, apart from a few exceptions, did not even need building regulations. Shared feelings about fellow-villagers also resulted in a very interesting elaboration of semi-public and semi-private spaces, as well as the formation of the town square as a place of gathering rather than any form of imposing-symbolic nature (Figs. 23, 39).

Later developments allowed some villagers in a few islands to become successful traders. This fact, on the one hand, disrupted the socio-economic basis of the islands' unity while, on the other hand, inevitably resulted in changes in their built form. The merchants could no longer identify with their modest houses. They built bigger ones and, in most cases, they erected high walls along their courtyards and replaced their doors with heavier ones. The image of these islands has changed completely and this can be felt immediately when one approaches them (Sapounakis, 1978) (Fig. 40).

But even when one contemplates environmental change conducted by a single individual, similar contradictory features may be



Private and public space in a typical village section. Streetscape is characterized by smooth transitional elements.

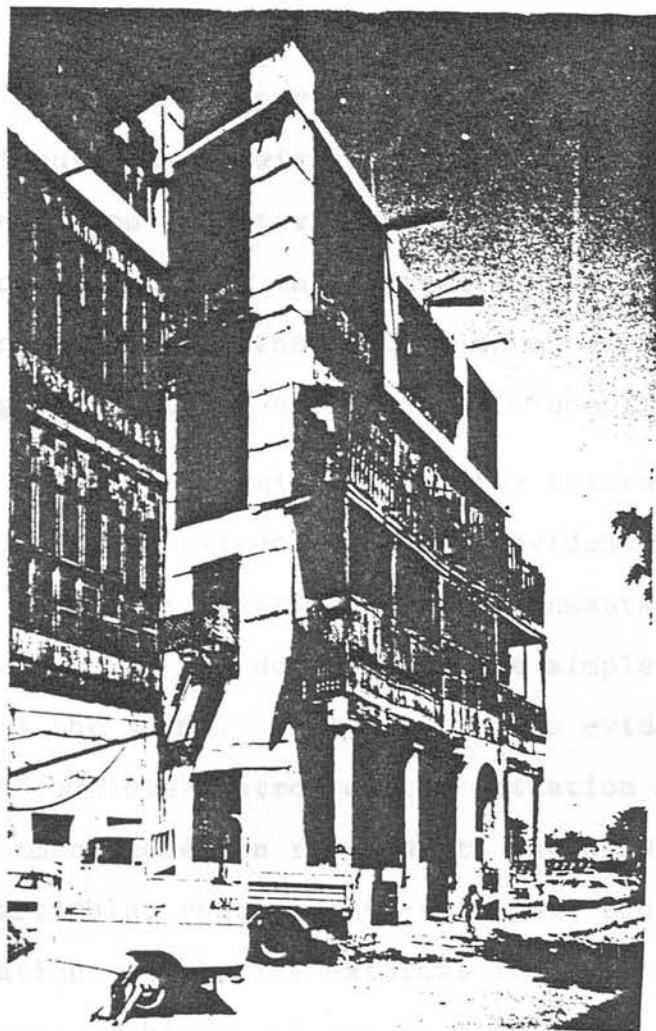
FIGURE 39



FIGURE 40

Houses, like the prominent one in the small harbour of Hydra, belong to rich families. Apart from their impressive dimensions, they are characterized by their distinctive front doors and the fact that the piece of land they occupy is surrounded by a high wall.

considered to be a carrier of more than one ideology on different levels, and it is possible for some aspects of them to be in conflict.



A house in Jeddah using both traditional and modern ventilation systems.

FIGURE 41

A person may be conscious of such a conflict as he may be in a stage of reforming some of his values or theories. A result of this may be seen in various environmental changes in everyday life. In Saudi Arabia for example, the conflict between traditional and western ideology has led owners of old houses, which used to be ventilated by traditional

ingenious methods, to install air-conditioning units in addition to the existing systems (Fig. 41).

A city as a whole can be said to contain a collision of various ideologies. As Peter Smith points out, "the urban system, in its pure phenomenology, epitomizes and magnifies human tensions and paradoxes" (Smith, 1974, p. 114-5). The social environment with all its contradictions tends to be projected and objectivated in concrete form not only through the complexities of the composite need for change or the external factor in the production of environment, but also through the actions of individual "doers".

To conclude the examination of the internal factor in the production of environment, it is evident that all representation of social relations on environmental forms is conducted by the "doer", or "doers", for the simple reason that they produce the forms. Yet, it is also evident that they are not in complete control of the situation since production of environment comes in response to the need for change and the particular requirements set by it and is liable to the limitations set by the external factor. As regards these constraints, the "doer" can do little else than allow the social relations discussed in the preceeding sections to become represented on the end product.

It has been shown, however, that there is an additional body of objectivated social relations which may be different from those of the composite need and the external factor, and which originate from the "doer" himself. When one sees the "doer" as a person in his own right, his behaviour

is based on his prior experience and overall motivation in life. It is in this context that he approaches each problematic situation. For this reason, it appears that there will always be a possibility of the end product to contain representations of his characteristics as a person and his intentions as regards the particular situation.

The internal factor has been examined as influencing environmental forms in two stages of their production: the stage of the interpretation of the problematic situation and the definition of the need for change and the stage of the actual design and production of the form. The first process allows more social relations from the conscious part of the "doer's" mind to be represented on the end product, since the doer concentrates on the requirements of the problem. The second process is more closely related to expressive behaviour and may involve elements which are deeply rooted in his unconscious in the form of archetypal images.

It is basically in the stage of synthesis that the "doer" can be regarded as "an individual who expresses himself", although this may also apply to some extent to the analytical stage. His input on the forms he designs partly refers to shared social relations and partly to his own personal comments and expressions. For this reason, the "doer's" input can be seen as objectivating his personality (even if this is merely in the form of a certain "personal touch"), while, on the other hand, it can also constitute an additional channel for the representation of the broader

social framework. Although this is clearly a complex function, one may trace isolated social relations (shared by a certain group of people), along with the "doer's" intentional or unintentional comments, in the concrete forms of man-made environment.

Finally no clear formulation can be made as regards the physical features that social relations, which are channeled through the internal factor may correspond to. As they originate from the "doer", they do not necessarily relate to the need for change directly and hence, they may become objectivated in any part of the end product.

1.2.5 Conclusion

From all the illustrations which have been laid above and in relation to the methodological approach set in 1.2.1, it appears reasonable to come to the formulation that: social relations, which are somehow involved in the process of the shaping of man-made environment, channeled through the components of the composite need for change and/or the external and the internal factor as described above, may become represented on the end product in the shape of concrete features. This process, which has been used as an instrument in the form of a working hypothesis throughout this approach appears to provide an adequate explanation for the variety of forms in man-made environment. As not all differentiation in form may be considered to correspond to potential information, this process appears to be giving an adequate account of the potential informational content of man-made

environment as well.

Checking the criteria set in 1.0, one may maintain that, when a certain appreciable amount of knowledge over the conditions of the production of a certain environmental form is provided, the approach outlined in 1.2.1 and followed in the subsequent sections may help in identifying a significant part of the amount and nature of the potential informational content. On the other hand the methodological model used seems to be flexible enough to be applied in different circumstances. The social-environment - built-environment relationship, which served as an indication for the definition of the methodological approach, can be said to be "re-proven" through analytical observation. The problem of attaining the whole picture of the potential informational content, as well as its hierarchical organization in respect to the need for change (whose analysis will also serve as a basis for a later part of this study) will be discussed in the following section and in relation to semiotics. The approach in the preceeding sections will also be appraised in a later part of this study in as much as the question of the importance of breaking down meaning into social relations is concerned.

It would be an omission not to mention the limitations involved in the approach employed. Firstly, the approach appears to be leaving out of consideration several geometrical patterns of spatial organization, such as those described by Moholy-Nagy in "the Matrix of Man" (1968). Why does a certain settlement, or spatial form, develop in a linear

fashion, while the one next to it may be concentric? A formulation which could answer this question is that certain social relations, as for example the need for certain people to be housed, living together, living in an orderly way and so on, may only affect spatial form so that it is patterned. Whether, then, such patterns will be square or orthogonal may be accidental or based on the particular conjuncture. Another attempt to explain this would naturally involve the acceptance of certain innate qualities in the human mind so that variety in patterns may be attributed to Jung's archetypal symbolism (Jung, 1964). Apart from all else, it would, then, strongly signify the continuity of the human species. A third approach would be to acknowledge that geometrical shapes, such as a circle, a square, or a triangle, differ in qualities. For example, the centre of the circle lies the same distance apart from all the points in the perimeter and this does not happen in any other shape. In this respect, certain shapes may be expected to fit in different social relations differently (as, for example, in the case of the village plane of Omarakana).

A second problem may arise from faint social relations and especially when these are products of the unconscious. Evidently, there is very little that can be done with this. It appears however, that a number of social relations are bound to exist in such a state and one can not predict the way that it is expected of them to affect built form.

Thirdly, the question of the every day production of

environment by "non-institutionalized" producers has been dealt with unsatisfactorily. It may be argued that what was discussed in relation to the primary functions and the existence of forms is more applicable to this case and especially when one is re-shaping the environment for one's own use; the reason being that, then, there are few questions of intentionality of communication. It also appears reasonable to suggest that in most cases of every day production of environment, criticality is significantly low, spatial forms or arrangements are not expected to be permanent and, hence, there is an increasing possibility for the end product to be characterized as a "low probability" one.

Lastly, to come to Levi-Strauss's statement according to which different societies appear to invest a varied amount of meaning in their spatial organization, the above example may serve to show that this may be expected to be the case for individuals as well; as regards for instance the difference between a tidy and an untidy person. And, although there may probably be an explanation in psychiatry, in the present context it appears reasonable to attribute this discrepancy partly on the grounds that they both invest meaning in the environment, but that order is something in which they differ. In this sense there may be some remote possibility for people, in settlements which bear little relation between social structure and spatial organization, to have invested some other kind of social relations in their forms. Invested meanings in environments may vary from say,

the bedouin and the desert (which, although bare, seems to have so much meaning invested in it that it arouses weaker feelings of alienation than, for example, a modern housing estate does), or the case of the Pitjedadjara tribe mentioned earlier, to the arrangements of furniture in the courts of law in the U.S. According to Hazard one may infer a whole body of social relations as regards the judicial system in that country depending on the way the furniture has been arranged (Hazard, 1962, p. 181-188).

Potential information, in as much as this is embodied in the environment through the process of its shaping, may vary largely. As noted, social relations "may be" represented on environmental forms. Whether they do or not, may be attributed to various factors, amongst which, as regards the user, may feature the degree of gratification of basic human needs, the possibility of the active transformation of the image (as in the case of the desert, see 2.2), and so on. As noted in the preceeding sections, the representation of social relations on environmental forms is influenced by a long series of factors, but it can not easily be seen as being determined by any of them.

1.3 SOCIAL RELATIONS AND THE SIGN IN MAN-MADE ENVIRONMENT

The danger which is clearly involved in dealing with the richness of the environment's potential informational content is to loose quality in the name of quantity. For this reason, and in relation to the problem of acquiring a whole picture of the potential content of a form, it is important to relate the findings of the preceeding sections to the theories of semiotics.

Let us consider Saussure's concept of the sign as consisting of signifiers (plane of expression) and signifieds (plane of content) (Barthes, 1967, p. 39). A certain set of social relations will be signified to the object's characteristics which represent it. The two entities - features on the one hand and set of social relations on the other - will form a sign. Naturally, since there is no sign when there is nobody to receive it, the above is liable to the percipients' characteristics and especially their past experience (see also 2.2). The degree to which this past experience is shared determines the amount of knowledge over the social relations of the particular situation and the broader context. Evidently, there are cases of considerable misfit in the past experiences of the "doer" and the percipients as, for example, in the use of the toilet bowl in different cultures. In that case, the same feature, say, the bowl as a whole, was a signifier to different signifieds generally depending on whether one was from the north or the south of Italy (see also Von Uexkull, 1934, for similar discrepancies).

In any case, this does not stop social relations, which are objectivated on a form, being regarded as potential signifieds, especially when this objectivation was intended as in the case of Bonta's signals*. Furthermore, since a certain degree of sharing of

* Based on Buyssens's and Prieto's ideas, Bonta comes to an interesting distinction as regards the signs in the built environment. Depending on whether these signs are intended to communicate or not, he calls them "signals" or "indexes". A third category of "intentional indexes" comprises these signs which are used to communicate but are not recognized as such by the percipient (Bonta, 1979, pp. 26-30).

experiences exists anyway, especially for members of the same society, one may assume that a significant number of social relations will normally act as signifieds. The rest of the social relations which have become objectivated on a form will potentially do so.

In examining the sign in the built environment, one is faced with additional difficulties. Although one may identify a series of pairs of signifiers and signifieds, yet these are not always clear. The analysis in 1.2 pointed out that social relations are not necessarily objectivated in distinct features of the end product. The physical characteristics of a form fundamentally refer to multisensory perception and may often appear obscure and ill-defined mainly because of their nature, (f.i. elements in the rough texture of white-washed wall). While some of them may be clearly distinct elements, others remain undistinguishable, unidentifiable and certainly immeasurable (see also 3.3). The question of what stimuli may be regarded as a source of information remains unresolved (Ittelson, 1976, p. 146).

Furthermore, the amount of social relations which usually becomes objectivated is typically endless. It is not seldom that environmental change is influenced by social relations as varied as the "doer's" relations with his parents in childhood, the attitude of a certain group of people towards God, an accidental loss of life, and so on. Apparently, all efforts to approach the sign through its general description based on the careful calculation and measurement of representational analogies must be abandoned. This approach should be

left for cases in which distinct ends require the examination of particular aspects of the sign*.

Given the holistic correspondance between social relations and physical features in the environment, it is important for this study to concentrate on the principles of their representation. What is needed at this stage is the understanding of how discrepancies in the nature and significance of social relations which have to do with the production of an object correspond to differences among the features of the end product.

Prior to this, it is important to make one point clear. Social relations are typically objectivated on environmental forms according to certain codes, however complex, articulated or multidimensional these may be. Whether the particular objectivation is intended or not, ideas, thoughts or concepts about people or things are codified into words, symbols or images selected from those existing in the vocabulary of a particular language. Such codes usually exist in the form of "social contracts" (Broadbent, 1977, p. 480). The code itself undergoes changes with each usage, either by being reproduced and therefore strengthened or by being transformed and renovated. In the light of what has been discussed in 1.2.4, it is interesting to note de Ventos' statement on the evolution of codes in which he identifies three fairly distinct transformationary stages (repetitive use of the code, "eccentric" use, pertinent creative use) that lead to the emergence of a new

* However, it is interesting to note Walther's division of signs into ten basic types according to the kind of information they contain (Krampen, 1979, pp. 38-42).

code (de Ventos, 1980, p. 181).

Let us now concentrate on the question of the content of objectivations and the correspondance of social relations to the features that signify them according to the codes noted above. Since social relations which influence the shaping of objects originate from various directions, some of the features of an object end up being a consequence of more social relations than others. Such features attain the potential of being denser in meaning than others. Features which have been given more than one meanings acquire the potential of operating as "shifters" (Barthes, 1967, p. 22; Agrest, 1976, p. 61). Shifters provide the conditions of the probability of producing different readings. According to Agrest, these connective structures of transition are the key to the understanding of the complexity of the built environment as an infinite text. The importance of this notion of shifter is that it potentially accounts for keeping the amount of information perceived at a reasonably high level while their nature differs according to the difference in readings (see also cognition, in 2.2).

The approach in the preceeding sections has suggested that certain social relations, which are more important than others, as regards the production of an environmental form, will tend to be more probably and, perhaps, more effectively objectivated. It has been observed that social relations which refer directly to the functions needed are responsible for not only the basic dimensions of a form but for its mere existence (see 1.2.2). This tight connection between the object and its function forms

what Barthes calls the "function-sign".*

As Eco points out, "the object of use is , in its communicative capacity, the sign-vehicle of a precisely and conventionally denoted meaning - its function" (Eco, 1980, p. 20). It follows that social relations which are so important as to initiate the production of an object - namely, those of the primary need and the primary function - become so clearly objectivated as to constitute a sign of denotation.

Krampen has argued against the use of the notion of denotation on the grounds that it advocates a "mono-functional" rather than "poly-functional" environment (Krampen, 1979, p. 34). Eco saw the concept of connotation as overcoming this problem. Signs of connotation can be defined as being formed by social relations which influence the shaping of an object and are not directly related to the primary need for its existence. Eco writes that, "besides denoting the function, the architectural object could among other things connote a certain ideology of the function" (Eco, 1980, p. 23). As we have seen in the previous part of the chapter, these "other things" to evoke connotations may be ideologies of the user or the problematic situation, the social framework or the particular conjuncture and, finally, the "doer" himself. Thus apart from denoting its primary function (i.e. "what" it is), an object connotes ideologies of this function (i.e. "how" it takes place). To relate the issue to Krampen's argument, Eco saw connotation

* To stress the significance of this relation, Barthes writes that "as soon as there is a society, every usage is converted into a sign in itself" (Barthes, 1967, p. 41).

as possibly "becoming so functionally important that the basic function might even be slighted, or distorted". The case of the throne (Fig. 7) typically illustrates this point.

Barthes, uses the term "rhetoric" to describe the set of signifiers to such connotations and the term "ideology" for the signifieds. Since signs of connotation are the result of the expression of social relations stemming from the complexities rather than the primary need in environmental change, they are bound to be unordered and discontinued. And as they can be regarded as having a whole "function sign" as a signifier, their plane of content will tend to be much broader than that of denotations (Barthes, 1967, 1977).

According to Barthes, when one contemplates his environment, "the first degree of intelligibility (below which one would perceive only lines, forms and colours) corresponds to the level of the identification of an object". At this stage meaning is merely relational and operational. But, he argues, "anyone from a real society always disposes of a knowledge superior to the merely anthropological and perceives more than just the letter" (Barthes, 1977). These higher levels of intelligibility* allow symbolism and ideology to be experienced. In view of the above observation as well as the distinction

* In a study conducted as early as 1939, Panofsky analyzed works of art and distinguished three "layers" of "meaning". The primary or natural subject matter, the secondary or conventional subject matter and the intrinsic meaning or content (Panofsky, 1939, pp. 5-7).

between denotation and connotation, we may analyse the sign in terms of first, second and third level experience. The findings of the preceeding sections form the necessary basis for this.

	DENOTATION		CONNOTATION THIRD LEVEL
	FIRST LEVEL (IDENTIFICATION)	SECOND LEVEL (SYMBOLISM)	(IDEOLOGY)
SIGNIFIER	The object as a whole and basic functional features		All physical features and "function-signs" of the object
SIGNIFIED	Identification of object and primary function	Social relations of the significance of the primary function in different contexts (i.e. ranging from the user and the particular situation to man in general).	Social relations which constitute ideologies of the composite need for change, the user, the doer, the particular situation, the social framework, the particular conjuncture and so forth.

TABLE 1.3

One can easily see that this table refers to signifieds as these are invested in objects in the course of their production. Consequently, and in reference to what has been discussed before, it becomes distorted in real life situations by the intervention of basically two factors. Namely, the evolution in the social context after the object has been produced* and various

* According to Eco conception of the "consumption and recovery of forms", the primary function of a form may change with the evolution of society. It may be replaced by a secondary one. The Parthenon for example was used as a shrine originally, while in contemporary times it has become a symbol, and that was its secondary function once (Eco, 1980, p. 28).

discrepancies in the perceivers' personal parameters, mainly past experience and motivation. Yet, both factors basically influence the model quantitatively. This affects the depth of experience in regard to the quantity of social relations which act as signifieds. The qualitative dimension of the distortion is limited to changes in respect to the perception of the object's primary function, or functions (for example, Pyramids and the toilet bowl, for the two factors respectively).

Table 1.3 aims at providing a picture of the whole range of social relations which may affect the shaping of an environmental form and become represented on it. The approach in 1.2 has pointed out that social relations involved in the production of environment vary largely in terms of width and depth since they may encompass figurative aspects of most, if not all, environmental objects while, on the other hand, they are of the most dispositional character as regards the evolution of mankind. To the extent that the above table contains these social relations in all their wealth and depth, it fulfils the first aspect of the second criterion set in 1.0.

Another point which has to be stressed with reference to table 1.3 is that in the analysis conducted in the preceeding sections nothing has shown that one must expect all social relations involved in the production of a form to be objectivated in the end product. Some of them may, for a number of reasons, manage to result in concrete differentiation in form, while others may not. Furthermore, it has to be made clear that there is no distinct one-to-one correspondance between a social relation and a concrete feature in the sense that a single feature may

correspond to more than one social relations and vice versa.

Lastly, it seems that it had to be left to semiotics to structure the sign hierarchically in terms of its significance. The concepts of denotation and connotation, although criticized by several researchers and on different grounds, appear to be well fit for this hierarchy as they provide a notion of the need for change which generates forms.

PART TWO

COGNITIVE NEEDS AND THE EXPERIENCE OF MAN-MADE ENVIRONMENT

2.0 INTRODUCTION

Once the link between social relations and differentiation in form has been analyzed, the interest centers on man, the perceiver. The aim of the second part of this study is to concentrate on human needs which ask for cognitive experience, i.e. cognitive needs, and examine how they relate to the potential informational content of man-made environment as well as how this affects man's mental world.

To achieve this, it is important to explore the nature of man's cognitive needs and the process of cognition. The two issues are discussed in the first two sections of this part of the study. After constructing a model of the levels at which cognition of man-made environment may occur, the aim of the second section is to establish empirical evidence as to which aspects of the theoretical model take place in reality. The third section attempts to outline the diachronical aspects of cognition of man-made environment by sketching both the context in which it occurs and its impact on man's inner structures. The fourth section considers the properties of both personal and environmental parameters in perception in an attempt to establish cues for the prediction of public images. Finally, the significance of the individual's cognitive experience of man-made environment is assessed in view of what has been discussed in the first two parts of the study.

Before getting involved with the discussion of the main issues, there are several items which need to be mentioned and, hopefully, clarified. The first of these is concerned with

the approach adopted.

As regards the philosophy of the approach, it has been noted in the introduction that, in an extremely controversial discipline like psychology, there are by and large two main-streams of philosophical dispositions among writers. These originate from the philosophies of nativism (Leibnitzian tradition) and empiricism (Lockean tradition). Although findings, in both traditions, start from entirely opposing assumptions, they both seem to give a fair account of different aspects of reality. The present study aspires to the difficult task of dealing with its problem without committing itself to either of these schools of thought. The way to overcome dichotomies, then, is to point them out and comment on both in an attempt to examine how each of them affects the argument in question. A reservation is held for the problem of testing the formulations drawn from this study against empirical evidence. However, because of the very nature of the subject, it is not possible to come to an absolute conclusion as to what social relations are experienced in man-made environment. On the other hand, it has also been noted that man is to be seen as a person as opposed to an organism merely responding to external stimuli. In the present context, the significance of this typically existentialist dictum does not so much lie in outrulling behaviourism as in diverting the researcher's and, especially, the designer's attention from man's merely operational needs. Man has other needs apart from those which relate to goal-oriented activity (see 1.2.2). The

issue then becomes a question of exploring how man's cognitive needs relate to this distinction (see 2.1).

As regards the scope of the approach, in view of the questions sought for, this part of the study deals with the problem of how and in what form social relations embodied in the environment become "internalized" in people's mental structures.

This is seen in response to man's cognitive needs. Consequently, the argument will not concentrate on neuro-physiological issues other than those needed, or on the purely visual aspects of perception. As the interest lies in the way social relations stored in the environment are assimilated, cognition will basically be seen as it occurs in what Piaget describes as the higher levels of intelligence, in which cognitive structures already present in the perceiver's mental world are so developed that a concrete operation is not needed as an intermediary stage to knowledge (Piaget, 1972, pp. 46-51).

Since this study focuses on cognitive experience of man-made environment in relation to the person's intellectual development, there has to be a discrimination against affective and evaluative experience. Evidently, both cognitive and evaluative experience occur together and form an inseparable whole (P.E. Vernon, 1961, p. 37). Still, some compensation to the theoretical division can be drawn from the fact that cognitions of evaluations or affects are to be treated as cognitive experience (see Heider, 1958). Jung has argued that every event of the conscious mind has its psychic associations (Jung, 1964). In view of this, and as these

psychic associations may be "felt" (i.e. both as affects and as cognitions over these affects), one may suggest that as social relations in man-made environment are cognited and "psychically" experienced, cognitions of the latter function give man a measure of both the outside object and his inner self. This observation provides an explanation for the way in which the experience of social relations in man-made environment may indirectly relate to self-consciousness.

Furthermore and with reference to the methodology adopted, it has been noted that, in 2.3, the diachronical aspects of cognition will be discussed, while a theoretical model for cognition is to be elaborated in 2.2. The problem which arises is that, since diachronic aspects of perception may occur both before and after any single perceptual experience, then synchronic aspects will be treated as having no context on which to be based. This awkward problem is treated by approaching cognitive processes in 2.2 as "neutral" functions, like complex equations which have to wait for the necessary variables so that they are put in operation. The missing variables are the person's already existing cognitive structures and they are to be identified in 2.3.

The last item which remains to be discussed in this introductory note is the definition of several terms which will be persistent all through this part of the study.

The first two are "personal parameters" and "stimulus" or "environmental parameters". Depending on the school of thought, theorists have attached different weight on each of

these two families of parameters which are in action in virtually any situation a man finds himself and which may be in conflict as to who will determine his behaviour, and this includes his experience. Lewin stood in the middle and argued that behaviour is a function of both (Lewin, 1964, pp. 238-40). Originating from a different viewpoint, anthropologists contend that there is a third family of variables to be considered: cultural parameters (Rapoport, 1976, 1977; p. 108; see also Tyler, 1972, for the discussion on the identification of such variables). The notion of a single individual's personal parameters (and especially his prior experience of the world) can be considered as being broad enough to include these, while it is to be noted that there may be many groupings among the personal parameters of different individuals. Personal parameters can be distinguished in the person's past (or prior) experience, and his motivation (which are his more trait-like characteristics) as well as his state of mind and his course of action at the given moment in time. Genetic factors are considered to be incorporated under the first two. Furthermore, in cases of groups of people, we may talk, of personal parameters, although this is clearly an ordered aggregate of factors and variables which is difficult to be identified in all its dimensions.

Environmental parameters are also difficult to be considered in their fuller dimensions. In the context of the present study, one may talk of the amount and nature of potential information in the environment although neither the first nor the second may be exactly known. The nature of

information may be particularly confusing as, on the one hand, there is no evidence as yet as to what constitutes a stimulus as a source of information, (Ittelson, 1976, p.146), while, on the other, the word nature may refer to both figurative and/or semantic aspects of the environment. When referring to more specific situations, solutions to the problem can be given by stating which aspects of environmental parameters in particular affect a function in question.

The other term that needs explaining is the term "schema". Bartlett first used the term in the 20's (although the notion originated from Kant) and described it as referring to "an active organization of past reactions, or past experiences which must always be supposed to be operating in any well-adapted organic response" (Bartlett, 1964, p. 201). The term was then taken over by Piaget who used it extensively with basically the same meaning. They both implied that a schema is a motor-sensory response to a particular set of environmental cues which helps to structure behaviour by being stored in memory to be re-activated when a set of similar cues comes into view. In the context of the present study, motor schemata are not taken into consideration. Furthermore, as regards other mental cognitive schemata, one may assume that a significant part of them consists of social relations while they may also have certain aspects referring to the senses (visual, tactile, olfactory and so on).

Although in the literature it tends to be used in a confusing manner, the term "image", is closely related to the idea of schemata. Boulding defines it as subjective knowledge - "what

we believe to be true" - all the accumulated, organized knowledge that an individual has about himself and the world (Boulding, 1956, pp. 5-8). In this sense, images are like schemata, as described above; they are not necessarily figuration, they may be to a degree shared between different people, they may be composed of both facts and values and so on. Momentary images may be regarded as the entirety of a person's perceptual experience at a given moment in time. Such a construct, which is both conscious and unconscious in nature, may usually be expected to embrace many different cognitive and evaluative schemata.

Finally, another term which requires some clarification is that of a person's intelligence. The literature is replete with a series of definitions (Wright et al, 1970, p. 482). Yet, the interest in the present context lies in exploring the relation between perceptual input and the process of the individual's intellectual development. For this reason, there appears to be no need for an exact definition of intelligence as such but merely in as much as it relates to the development of mental schemata which, as we will later see, form the link between the two poles of the above relation. It is interesting to note P.E. Vernon's view that "intelligence corresponds to the general level of complexity and flexibility of a person's schemata, which have been built up cumulatively in the course of his lifetime" (P.E. Vernon, 1960, p. 37).

Based on this notion, which is also adopted by Piaget, the impact of environmental experience will be assessed in as much as it affects these properties of schemata which form

the basis on which the individual's skills and capacities are grounded.

2.1 THE NATURE OF MAN'S COGNITIVE NEEDS

In this section, we will consider man's needs to know and to understand, i.e. man's cognitive needs. The discussion in 1.1.2 pointed that an environmental form is required to satisfy both the needs which are instrumental to the primary function, or functions, and those which are more directly related to basic human needs and, hence, transcend the scope of the particular activity performed in space. As the interest in the present study is in examining the implications man's cognitive needs may have on design, it is essential to explore the literature on the issue in an attempt to see whether these needs do fall under both the above categories as regards man's cognitive experience of man-made environment.

It has to be acknowledged that cognitive processes were not always seen as referring to a need to know which existed in its own right as a basic human need. Gordon Allport said that "some theorists - such as Schopenhauer, Kempf, Freud and others - have held that cognition (our thought-life) is essentially the servant of our needs and drives" (G.E. Allport, 1961, p. 259). In a similar sense, this can be said to apply to early behaviourist writers, such as Watson and Thorndike, and even later ones like Skinner. Interpreting the view of such early theorists, Bruner criticized them by stating that they regard it as merely being incorporated to other forms of goal striving. Bruner said that the only reservation these

these writers held for cognition corresponding to a more autonomous "need to know", is for cases in which the individual is confronted with novel stimuli (Bruner, 1956, p. 16).

Theorists of personality, who were to some extent following the Leibnitzian philosophical tradition and, hence, ascribed more qualities to the human mind than the blank slate condition and inertness at birth, found it difficult to conform with this view. Karen Horney declared that Freud's conception of cognitive processes is applicable only the neurotic. Instead, she maintained that man's higher mental processes exist in their own right and are not "at the beck and call of his impulses" (Arndt, 1974, pp. 270-1). Gordon Allport - who thought in terms of dimensions, rather than dichotomies, as regards the basic philosophical argument, and consequently allowed that man was both active and passive - argued that "there is nothing secondary about cognition. The hunger to know, to comprehend our environment is a basic motive in life" (G.E. Allport, 1961, p. 274).

It appears that the writer, who has further developed the idea of man's cognitive needs, is Abraham Maslow who is noted for the existentialist origins of his approach to the study of personality (see 1.1.2). Maslow said that the main reason we know little about the cognitive impulses, their dynamic or their pathology, is that they are not important in the clinic; "even cognitive psychopathology is pale, subtle, and easily overlooked or defined as normal... As a consequence, we find nothing on the subject in the writings of the great inventors of psychotherapy and psychodynamics, Freud, Adler, Jung etc."

(Maslow, 1970, p. 48).

Based on evidence from his clinical work (see also Beck et al, 1979) and other studies, Maslow argued that "the overcoming of obstacles, the occurrence of pathology upon thwarting, the wider spread occurrence (cross-species, cross-cultural), the never dying (though weak) insistent pressure, the need of gratification of this need as a prerequisite for the fullest development of human potentialities, the spontaneous appearance in the early history of the individual, all these point to a basic cognitive need". He, then, observed this need escalating in two ways as, "even after we know, we are impelled to know more and more minutely and microscopically on the one hand, and on the other, more and more extensively in the direction of a world philosophy, theology etc.". In response to this, and along with his five sequential stages of basic human needs (see 1.1.2), he postulated the existence of a smaller hierarchy in which the desire to know is stronger over the desire to understand. These cognitive needs, however, should not be considered as separate from the basic needs because "the desire to know and to understand are themselves conative, i.e. having a striving character, and are as much personality needs as the basic needs" (Maslow, 1970, pp. 50-1).

In this sense, Maslow incorporated in his smaller hierarchy of basic human needs the instinctoid need to make sense out of one's environment as well as "the need to know for its own sake, for the sheer delight and primitive satisfaction of knowledge and understanding per se" (Maslow, 1968, p. 63).

This latter impulse, which is clearly associated with unique

affective states and is described by Bruner as leading to a "Eureka" experience, has been used as a basis for inferring the presence of a generalized cognitive need by a number of theorists (Bruner, 1956, p. 17).

Among contemporary psychologists however, the existence of autonomous cognitive needs, such as the ones described by Maslow, is not widely accepted. Maslow's holistic formulations in this context appear to be eligible to serve as indications for an explanation to the problem, while a certain bias towards overt behaviour has led the issue to be approached at a different level. Studies such as Bartlett's (1932; 1958) and Tolman's (1948), where the "effort after meaning" and the concept of a cognitive map in purposive behaviour was stressed, introduced Gestaltist cognitivist elements in behaviourist thinking and provided the initiative for research in cognitive psychology.

Theories of the relative consistency among cognitive structures in the individual's mental world, like the theory of cognitive dissonance postulated by Festinger (1959), and the attribution theory, which originated from Heider (1958), proved to be notably influential. Festinger's main point of departure was the formulation that the presence of dissonance in man's mental world gives rise to pressures to reduce that dissonance (Festinger, 1959, p. 263). One way of coping with such pressure is through further cognition. Heider, who is more directly concerned with cognition as influencing action, adds more to the discussion on cognitive consonance (or "balance", as he calls it) by maintaining that "of great importance for

our picture of the social environment is the attribution of events to casual sources" (Heider, 1958, p. 16).

Although these theories clearly point toward the identification of a certain need-state which arises from man's mental world, it has to be acknowledged that there still seems to exist some doubt as regards the nature of this need-state - i.e. whether it leads to a motive, drive, tense state or else (see Davies, 1968, p. 330; Weiner, 1972, p. 293 and pp. 301-7) and the extent of the pressures it sets (Wyer, 1974, p. 139-40). Still, as the cognitive structures in a person's mental world when taken as a whole may rarely be in complete consonance (Festinger, 1959, p. 16), allowing for some discrepancies in individual personalities, it seems reasonable to assume that, for any person, there will always be a tendency to reach such a need-state. In this sense, exploratory activity may be seen not only as resulting from the accidental encounter of novel stimuli but also as being initiated by the very complexities of the development of man's mental world (Hunt, 1963, p. 399). An interesting overview of the significance of knowledge for man is provided by writers such as Piaget (1971), Waddington and Lorenz. According to them, life processes in general, and evolutionary processes in particular, are fundamentally involved with the acquisition of knowledge about the environment. In general, the greater the knowledge an individual member of any species has of the environment, the greater are the chances that the individual will survive and reproduce in that environment (Fishbein, 1975, p. 132). A similar

generic approach which arrives at the same conclusion is based on cybernetics and, has been postulated by Herbert (1972, p. 101-6). Such biological or mathematical approaches are pointing at the importance of the need to know and to understand as being derived from the very fact that man finds himself in a world in which he has to adapt in the most efficient way in order to survive.

It appears from the above that, although knowledge of the environment can be considered as being of notable significance to man, the need to know and to understand is not always accepted as existing in its own right, i.e. an autonomous basic human need. But even if one does not accept this stance, the overview of the literature, presented above, shows that cognition may correspond to other basic human needs such as safety needs, adaptation needs, a need for some balance in the person's mental world, a need to explore the environment as a result of the development of man's inner structures and so on. Although these needs may relate to goal-oriented behaviour as regards the activities performed in space (f.i. in adaptation), they do not always do so since they are a function of man's deeper psychological needs and stem from the totality of his being-in-the-world. Cognitive experience of the environment may relate to cognitive needs which have developed from those deeper needs and exist regardless of the activity the person is engaged in at the time. In this sense, whether taken as autonomous or not, cognitive needs can be seen as following the distinction proposed in section 1.1.2.

2.2 THE RECEPTION AND INITIAL PROCESSING OF ENVIRONMENTAL STIMULI

In order to examine how man's cognitive needs relate to his experience of the potential informational content embodied in man-made environment, it is essential to consider the functions and processes which affect the way cognitive experience occurs. As noted in 2.0, the issue can be approached from two different angles and it is necessary to follow both so as to attain a clear picture. The first approach isolates cognition from many of its long-term aspects and assesses the dynamics of the intricacies involved in the momentary situation. The second approach views the issue in a diachronical sense. By doing so, it provides a picture of the context in which individual cognitions occur (in terms of cognitive structures already present) and allows such cognitions to be considered in relation to their impact on the person's mental world, seen as a whole.

Evidently, both approaches are concerned with the analysis of the same event, i.e. man's cognitive experience of his environment. Since the aim is to arrive to conclusions as regards different aspects of it, however, they are required to be methodologically distinguished, even though to an extent overlapping.

In this section, the first approach to the issue will be conducted. Since cognition is part of the broader function of man's perception of his environment, several fundamental aspects of the latter function must be considered. The term perception as used in the literature embodies a multitude of definitions and meanings, whether referring to the actual process of

perceiving or to the end product of this process. The definition is often implied rather than being explicit. It is interesting to note that the "International Encyclopedia of the Social Sciences" takes over fifty pages to discuss the meaning of perception.

In the classical and strict sense perception relates to situations where stimulus is present. Perception is the middle step in a hierarchical process of sensory awareness between sensation, which is the initial, unorganized, response to a stimulus, and cognition and evaluation, which represent a general awareness based on some form of a summary of all previous stimuli.

Awareness or interaction with the environment is achieved primarily through visual experience, although it is clearly an amalgam of other sense experiences, such as auditory, olfactory, tactile and so forth. In the present context, however, perception refers to more than direct apprehensions of the senses, as the perceived environment is significantly more than the sum of sensory experiences. Perception, therefore, is used neither in a physical and neurological nor in a strictly literal sense, but more extensively. Such a definition, incidentally, is in keeping with the Latin origin of the word "percipere", to comprehend.

It follows that perception can be divided in three fairly distinct stages: sensing, cogniting and evaluating. Acting may be considered to be a fourth stage only that it does not refer to the experience of the environment as such but to the overt response to it. These three stages (and, in some extreme cases, all four of them) do not generally exist as distinct

periods of time. Unconscious reception and processing of stimuli and the forecasting of what is to be perceived draw them together into a continuum. Although environmental experience retains the hierarchical order noted above, this continuum ostensibly exists as a whole and is sometimes difficult not to be approached as such.

2.2.1 Expectancy

A very important dimension in perceptual experience is given by the fact that, even before the sensing of environmental stimuli occurs, one is generally prepared for it. Kelly considered the element of anticipation as being critically central in his "theory of Personal Constructs" (Kelly, 1955, and especially pp. 46-50) while a similar attitude can be found in writers in the Gestalt tradition, such as Lewin and Tolman. Piaget wrote that previously acquired information causes anticipatory reactions at all the higher cognitive levels, to the extent that one of the essential functions of knowing is to bring about foresight (Piaget, 1971, p. 91).

In real life situations a person always tends to anticipate the situations he finds himself in. Whatever the situation, man automatically grasps its basic components, that is "the feel of the place", while being simultaneously aware of what may happen. This "awareness" however, generally occurs in a literal sense, as there is evidence to suggest that a major part of this anticipatory function takes place unconsciously (Kaplan, 1970; Dixon, 1971). Whether conscious or unconscious, it is mainly based on the comparison of the particular situation, as this becomes conceptualized through its basic components, to

analogous situations, events, generalizations of these and their outcome. Such Juxtaposed data typically contain social relations in the form of cognitive schemata which are encoded in the individual's mental world.

The need for the individual to familiarize himself with the "feel of the place", wherever he finds himself, basically stems from his safety needs and is sustained by the fear that something might spoil his course of action at the time. The role of his memory system in this is evidently crucial. Furthermore, the fact that, even in fairly early developmental stages, one somehow manages to anticipate and grasp the "feel of the place" suggests that, even when already acquired knowledge of reality may be considered inadequate, one may still be capable of activating some anticipatory set of mental schemata from the memory banks of the brain. A similar ability for the adaptation is also to be noted for cases in which people find themselves in environments and situations they are not familiar with. It appears that there can always be a certain set of schemata which is to be juxtaposed to the uniqueness of any real situation to a satisfactory degree.*

The word "situation" does not only contain attributes of a particular social environment but it also implies the individual's orientation and predisposition towards it. These characteristics

* It might be interesting to see how this juxtaposition may form so accurate a fitting that, in extreme cases, it may result in what is psychiatrically defined as "deja vu" or "jamais vu".

of the person may be seen functioning at two different levels. Firstly, in relation to his motivation and, secondly, in respect to his current state, that is: his state of mind at the moment. In any case, the process of grasping the "feel of the place" is influenced, not only by personal parameters, but also by environmental ones. A clear and legible environment will tend to be grasped easier than a confusing one (See also 3.3).

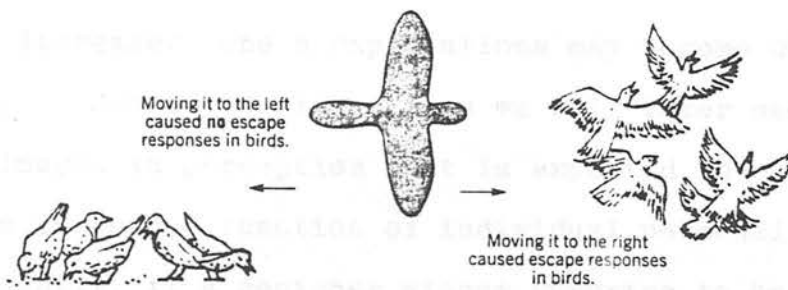
The reading of every situation one finds himself in and the understanding of the social relations which constitute its basic components is very significant both for the percipient and for the scientist. By triggering schemata which are encoded in the memory banks to come at hand, it both revitalizes them and keeps the brain alert while, at the same time, it provides an indispensable context for perception to occur in. Due to expectancy, perception of the environment occurs in a continuum and tends to be always forecast. Therefore, one not only expects what is to be perceived, but also one might even know how one would perceive a particular object. For instance, a person may "know" beforehand, the moment he opens the door to enter the room, that it will appear beautiful or that a particular object in it will attract his attention.

The fact that certain perceptions are expected while others are not is related to two important characteristics of the actual experience of the environment. Firstly, it provides an element of subjectivity since one tends to relieve one's own schemata, the product of one's own past experience, rather than to adjust them (see Boulding, 1956; and 2.3.2). This

can be seen from the experiment in which several species of birds will attempt to escape when a certain model (the model of a large bird with short neck and long tail) is passed overhead. Birds that were occasionally attacked by a hawk were used to the idea that such a thing may happen again. Consequently, they responded strongly to a hawk silhouette passing overhead (Buss, 1973, p. 145; Fig. 42).

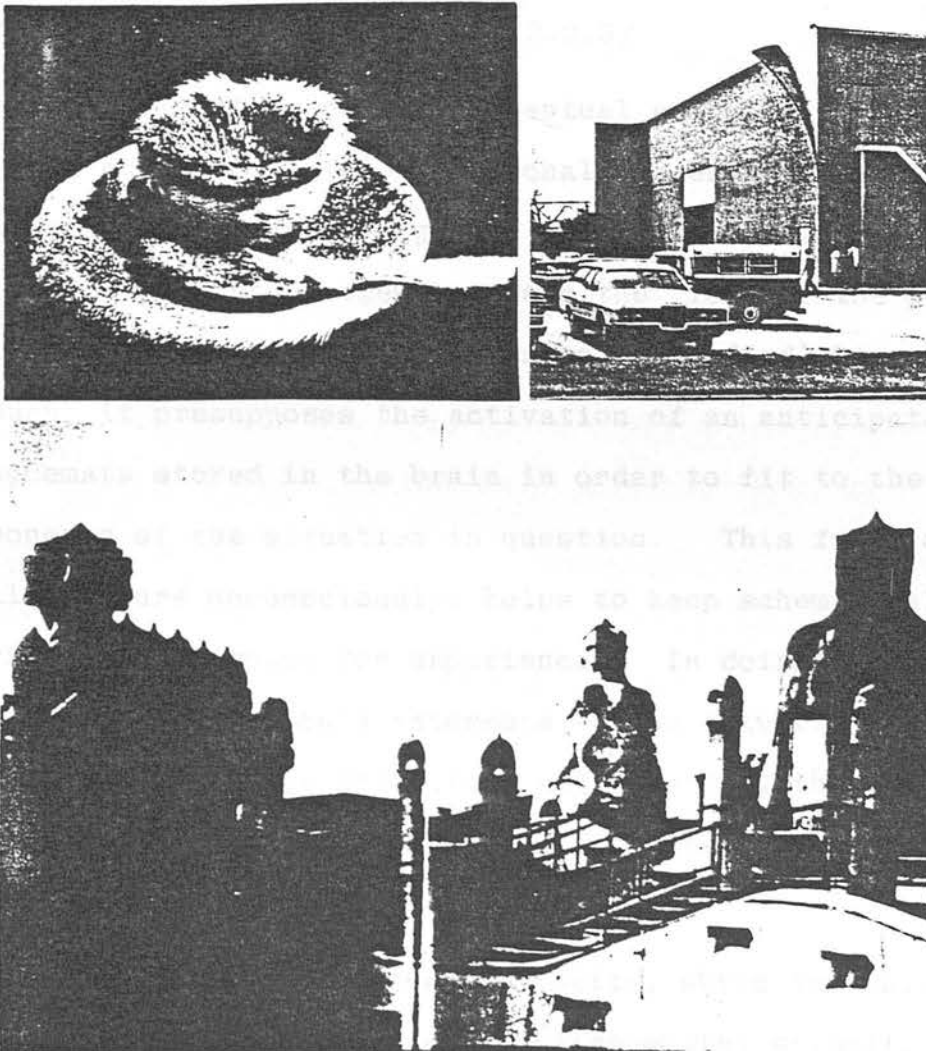
Secondly, anything unexpected tends to draw more attention than what it would normally draw. In other words, low predictability increases the level of arousal (Shannon and Weaver, 1949, p. 108-9; Mehrabian and Russell, 1973). In view of what is being discussed in the previous part it can be clearly seen that the built environment as a form of human expression may deliberately incorporate the element of surprise to attract attention. In this sense, higher level of arousal and attention appears to be evoked by the objectivation of such social relations that the percipient would not expect to perceive in a given social context. Consequently, he has to focus his attention closer on the intruding social relations, while at the same time it is important for him to reassess social relations which relate to the "feel of the place" of the particular situation seen as a whole (Fig. 43).

Although surprise and novelty contributes significantly to the direction of an exciting environment (f.i. Japanese garden, open-air market, and even Alice's encounters in "Alice in Wonderland"), it may still incorporate two weaknesses as it mixes with the person's personal parameters, and especially his interest in the situation. Firstly, not all unexpected



Moving the model to the left caused no escape responses to birds. Whereas, moving it to the right, it did.

FIGURE 42



Top left: "Object", by Meret Oppenheim, 1936.
 Top right: One of the buildings of "Best" Products.
 Bottom: The roof of Gaudi's Casa Mila, 1905-10.

FIGURE 43

encounters are pleasing, in fact, as arousal and attention become increased, one's expectations may become difficult to satisfy. Secondly, although as we will later see there are group images in perception what is expected to be experienced remains largely a function of individual personal parameters. Consequently, if a designer wishes surprise to be evoked he would either ensure that he is well aware of the user's personal parameters in their basic components, or introduce such functions in the design (i.e. people in the street, open-ended design etc.) that will enable elements of potential surprise to keep recurring (see 3.2.3).

In summation, expectancy of perceptual experience can be seen as being a function of both personal and environmental parameters. It can be regarded as an attempt from the individual's point of view to grasp the "feel of the place" of any situation he finds (or, is going to find) himself in. As such, it presupposes the activation of an anticipatory set of schemata stored in the brain in order to fit to the basic components of the situation in question. This function, which usually occurs unconsciously, helps to keep schemata alert and provides a background for experience. In doing so, and in relation to the person's interests in the situation, it may be expected to affect the actual experience of the environment as this is bound to take place in the context provided by this background.

It may also be said that the continuity, which is manifested in the perpetual forecasting of environmental stimuli, constitutes a structural element in the way in which man's experience of his environment occurs. Ignoring it may have

serious consequences both in practical and theoretical situations geared towards an explanation of man's perception of the environment.

2.2.2 Sensing the Environment

Man perceives his environment through his senses. Stimuli from the environment are received by the sensory organs where they are transformed into neural impulses so that they are carried through the nerves to the brain. Each kind of receptor has its own neuron path to the cortex. The nerves from the eye to the brain, for example, convey impulses only about light, and this is true whether they are electrically stimulated or are stimulated by light or even by rubbing the eyes. And there is point-to-point projection of the retinal image on the occipital lobe of the cortex. Thus different kinds of sensory impulses are kept separate by sending them along distinct and specific routes from the receptors to the sensory areas of the cerebral cortex, which is the final part of the sensory neural circuit (M.D. Vernon, 1962, pp. 12-13).

The initial phase of perceptual experience, according to many theorists, is essentially figurative in nature (Piaget, 1969), it involves all the senses and it is needless to comment on its necessity.

Certain aspects of this stage are of some importance in the context of the present study. Firstly, the fact that stimuli from the environment may be received by any sensory organ, and, in fact, as it usually happens, by many receptors simultaneously. Although it seems to be needless to point out the typically

multisensory nature of perception, designers generally tend to contemplate the environment in visual terms. Yet, although vision appears to be particularly flexible in relating to distinct and definite schemata when compared to other senses (and, hence, is more reliable because of its nature), environmental experience is an amalgam of all senses.

The second aspect of interest relates to the distinction between man's cognitive and operational needs. Based on an impressive series of experiments, Piaget has argued that, at this stage of perceptual experience, the eye focuses on certain elements in a form. This function, which Piaget calls "centration", explains perceptual deformation, as in the case of primary illusions. Compensation to this, he argues, can be derived from the co-ordination of such centration, a co-ordination which he calls "decentration" (Piaget, 1969). He then related this process to the exploratory drives of the human mind. Bruner later suggested that a process, which operates in much the same way as Piaget's decentration, may be what "frees" cognitive activity from the "domination" of man's particular goal-oriented behaviour (Bruner, 1956, p. 16).

Finally, it has to be acknowledged that the question of defining exactly what properties of the incoming, say, optic array are informative for vision, is not settled yet for psychologists (Ittelson, 1976, p. 146). Accordingly, the exact definition of the transitional point between sensation and its cognition remains obscure. Both for methodological and substantial reasons, it is important that in the context

of the present study the process of sensing the environment is confined up to the moment that intelligent brain interferes in the form of cognitive schemata of social relations. Evidently, this is merely a theoretical distinction since, as discussed previously, mental schemata may be activated in advance, before actual sensing occurs, as a result of expectancy. It has to be noted that this methodological viewpoint is not consistent with the one expressed by Rapoport. Rapoport distinguishes three stages of perception (perception, cognition and evaluation) but includes first-level cognition (that is: identification) in his first stage of sensory perception (Rapoport, 1977, pp. 30-4). The theoretical discrepancy between the two viewpoints is proposed to have certain repercussions in the development of the argument. As a result, this issue will require further attention at a later stage, when the discussion will center on the amount and nature of potential information in the environment in view of an optimal level of stimulation (see 3.3.2).

In the present context, sensory perception is regarded as a more or less mechanical procedure, as it is characterized by the confinement noted above. Hence, the distinction between sensing the environment and cogniting it is approached as being qualitative in nature. In any case, it is evident that sensory perception constitutes the vital and indisposable "doorstep" of environmental experiences.

2.2.3 Environmental Cognition and Possible Varieties of Cognitive Experience

As has been mentioned above, any individual at any moment possesses an experience of the world and this experience equips

him with a vast amount of knowledge in the form of mental cognitive schemata. Such schemata, which are not necessarily dimensional and may contain social relations, vary in abstraction and are encoded in a fairly hierarchical order in the memory banks of the individual's brain. As the individual finds himself in a situation and environmental stimuli are expected, a significant amount of relevant schemata (having to do with the social relations which constitute the basic and other components of the situation) are unconsciously brought back from the memory banks to stay at hand.

As soon as a stimulus reaches the brain it triggers several* relevant schemata, generally out of those already energized, and is juxtaposed to them. This process, which constitutes the essence of environmental cognition, is by no means as simple as it sounds, a reason for this being the operation of the unconscious, or "primitive" (see Smith, 1977, pp. 32-5) part of the brain.

In a strict sense, it is only when environmental stimuli channelled through the senses meet relevant schemata in the brain that they become environmental signs. It is only at this stage that they become attired with meaning, even when this meaning is the mere identification of an object. In fact, this first level cognition (i.e. identification) may vary to an extent from one person to the other since it is a function of past experience. In some extreme cases, as for example in the case of the toilet bowl, it may even vary

* As Bruner (1956) has shown, this is generally not a one-to-one relationship.

amongst people who, by and large, share the same culture. To avoid such misunderstandings and to stress the significance of personal and consequently, cultural background experience in providing the basis for the cognitive dimension in perception, it appears to be reasonable to have excluded first level cognition from the stage of sensing the environment.

The Selective Organization of Perceptual Input

The effect of personal parameters, and especially past experience and motivation, in how this initial stage of matching schemata to incoming stimuli takes place, is also related to selectivity. This aspect of perceptual experience may be seen as occurring at three different levels, all having to do with how cognition takes place.

Firstly, as the early Gestaltists have pointed out, the individual sees objects as organized Gestalten. Although, retinally an object can be described as a mosaic of discrete pinpoints of light of varying wavelengths, the fact that cognition is based on juxtaposition of schemata makes people experience chairs, buildings, landscapes and so on. Secondly, among all the possible characteristics of an object only certain ones are experienced. Concepts from information theory, like redundancy and channel capacity, explain how the perception of a few characteristics of an object is enough for the object to be identified (Rapoport, 1977, p. 196). Finally, only certain objects, or features of objects, among all that exists "out there", enter the person's experience of the external world. Other features either play a minor role or are not included at all, for reasons other than redundancy and channel

capacity. This may partly be attributed to expectancy and the anticipatory set of schemata already activated, and partly to a phenomenon which Gordon Allport described as the projection of the person's "mental set" on the perceived situation (G.E. Allport, 1961, p. 259). This latter function may even be expected to de-form the image to fit the requirements of the individual.

The selective organization of perceptual experience is determined by both personal and environmental parameters, as two interacting sets of determinant factors. In this sense, when one wishes to make a telephone call, phone booths become brighter and clearer; one's house always stands out in one's eyes as opposed to those of the neighbours. So does a corner shop, a particular bench or tree, in short most of the spots in the neighbourhood or even in the city centre that one might be or feel somehow related to. In other words, social relations which have been either objectivated on environmental forms in the course of their production or invested in them once they are produced, as well as the way these social relations are represented in concrete form, combine with the person's past experience and motivation, state of mind and course of action at the time to determine how selectivity will occur. Thus, humans are regarded as active perceivers in as much as they, consciously or unconsciously, organize their perceptual experience.

Possible Varieties of Cognitive Experience of the Man-made Environment

Although discrepancies in personal parameters may interfere in a

number of ways in the way cognitive experience takes place, most psychologists would agree that what people tend to "see" in the environment is objects in the broadest sense of the word (see, for example, Seymour, 1979). In the context of perception of man-made environment, this would be first-level identification (see table 1.3). This is sustained by the fact that cognitive activity often is instrumental, functional in nature, as it relates to man's everyday purposive behaviour. Thus, objects may be expected to be identified basically in as much as their basic qualities, and, above all, their function, relates to man's operational needs (see also Fig. 44).

But, man may be expected to perceive more than this. As cognitive schemata are representations of reality on any possible level of approaching it, a single environmental stimulus may evoke multiple cognitions corresponding to juxtapositions against different schemata. Gregory has argued that perception involves conscious and unconscious inference, "a kind of problem solving, a kind of intelligence" (Gregory, 1970, pp. 30-31). In this sense, it appears that cognition may not necessarily have to confine itself to the first level identification of man-made environment. It seems logical to suppose that cognition may extend to cover the whole potential informational content of a certain environment, especially in view of Heider's argument, according to which it is important for our picture of the social environment to attribute events to casual sources (Heider, 1958, p. 16).

At this point let us again consider the potential informational content of man-made environment as this has been discussed

TOP: "Brillo Boxes", by
Andy Warhol, 1964.

BOTTOM: "The Air and the
Song", by Rene Magritte, 1964.

It appears that one must
not assume that first
level identification is
always an easy task as
there may be several over-
lapping primary functions.



FIGURE 44



in the first part of this study. Table 1.3 presents an
array of social relations which may be represented on
environmental forms in the process of their shaping. As
noted in 1.3, those social relations may be seen as unfolding
in two different dimensions, i.e. width and depth, depending
on whether one considers different environmental forms or
whether he is searching for the most enduring and disposit-
ional characteristics of society and the world, as these have
affected the shaping of a single form.

It is possible that, in this content, new meanings are added.
As society evolves, standards and needs change and this may

affect structures of the past. This has happened in cases of forms like the Pyramids or the Parthenon (see 1.3) and there is no reason for it not to occur in more short-term changes. As environment forms may be considered to be cultural modifiers (Hillier et al, 1972), it is reasonable to expect that culture may react by putting additional meaning on them. Yet, this meaning is of interest in the present context only if it corresponds to an appreciable consensus among members of this culture. Only then, it can be considered as an inseparable attribute of man-made environment and, as such, it can be regarded as being integrated in the potential informational content identified above. Additional or new meaning may be incorporated in each of the categories of table 1.3 depending on what it refers to. The case of Parthenon, for example, affects the first two categories, whereas meanings which have recently added to villages in the Greek mountains, referring to them being remote, backward or else, are connotational.

In view of this enriched potential informational content of environmental forms, cognitive experience may theoretically be seen as occurring at three different levels in respect to table 1.3. Apparently, second and especially third level cognition involve a notably wide spectrum of schemata of social relations. A number of illustrations of such social relations were given in 1.2, where the way in which potential information are stored in man-made environment in the process of its shaping has been examined.

Furthermore, as the individual gets actively involved in

perception, cognitive experience does not confine itself to these. Depending on all four of the individual's personal parameters, cognition may disentangle itself from what is literally "there" to be perceived. As such, it may range from a tangential associational cognition (e.g. as described by Smith, 1974, p. 52) to a completely different meaning being attached to the object. Arthur Koestler had said that activities such as listening to music or, even, reading Kant can lead to the experience of a whole series of apparently irrelevant schemata (Koestler, 1964, p. 325). In addition to this, the "effort after meaning" may be so urging that, as Lawson wrote, "we find pictures in the clouds and the coals of the fire almost as readily as we recognize the faces of our friends and relatives" (Lawson, 1980).

Fourth level experience may be regarded as being related to what Sartre called "the imaginative transformation of the image;" evidently, a crucial notion of phenomenology (Fell, 1965; see also Sartre, 1971, pp. 63-96). Such experience may reach the same depths as second and third level experience; yet, it often does so in an inorderly manner, as it generally constitutes an inseparable whole with affective experience.

It has been suggested that certain environmental features are more prone to give rise to associations and different readings than others. Jencks's analysis of metaphors (Jencks, 1981, pp. 40-92, see Fig 45) and Agrest's of metaphors and shifters (Agrest, 1976; see also 1.3) elaborate on this idea. In as much as metaphors are concerned, one could perhaps argue that, although their experience appears

associational, it is not entirely so. It is not seldom that "doers" objectivate either distinct social relations from another context or somehow archetypal images capable of receiving a variety of interpretations. For this reason, such experience is both third and fourth level cognition.

experience of social relations in architectural design

appears theoretically sound as a formula but may happen

how can it be proved that it does?

An answer to these questions is to be found in field studies

conducted by psychologists, architects and geographers on

people's cognitive maps as well as on their spatial behavior.

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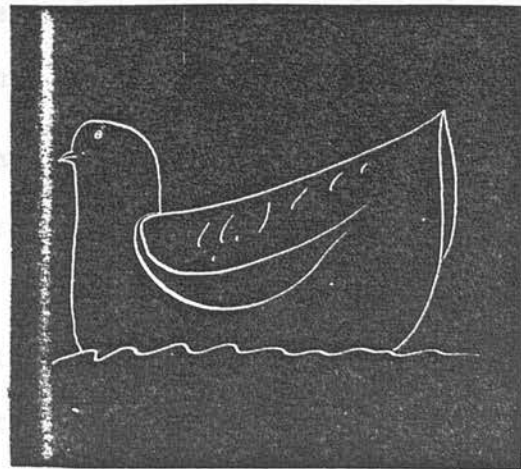
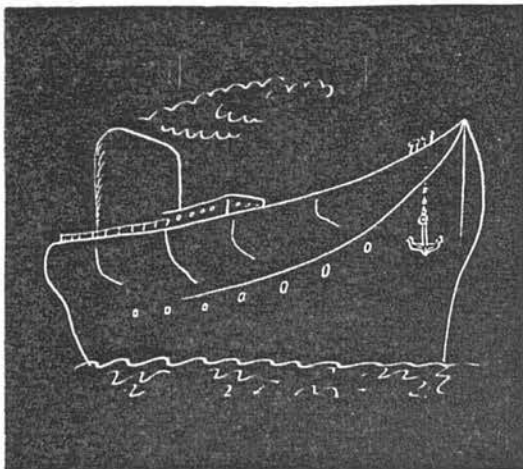
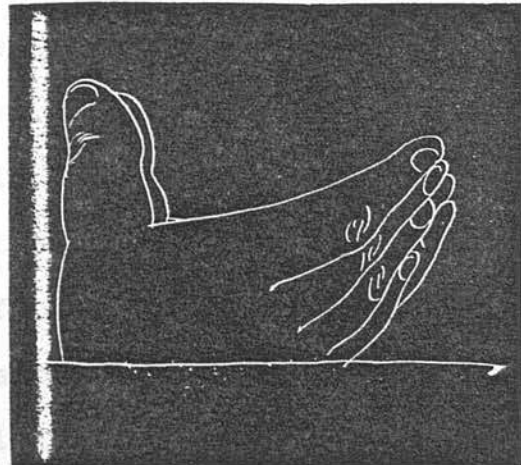
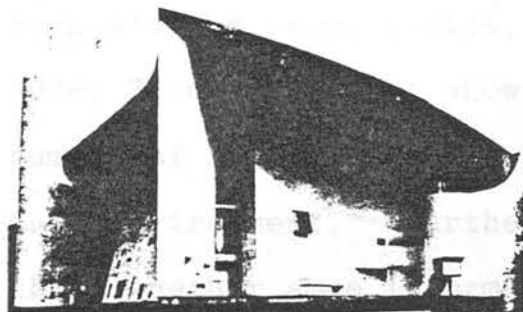
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Charles Jencks presents a series of experiences of le Corbusier's Ronchamp (top left). The designer himself has admitted the "crab shell" form of the roof.

FIGURE 45

The Problem of Testing How Cognitive Experience Occurs

Once the varieties of man's cognitive experience have been described (in terms of first, second, third and fourth level cognitions), the question that arises is how can one be sure that people do cognite such information. Even if the experience of social relations in environmental forms appears theoretically sound as a function that may happen, how can it be proved that it does?

An answer to these questions is to be found in field studies conducted by psychologists, architects and geographers on people's cognitive maps as regards the cities they inhabit. Apart from Lynch's pioneer work (Lynch, 1960), a series of such studies (e.g. Gulick, 1963; Steinitz, 1968; Milgram, 1976; Zannaras, 1976) show that people do experience a number of social relations from those embodied in the man-made environment. Furthermore, this body of research shows that, whether some information will be known, or invested with some notable importance and so on, is a function of both personal and environmental parameters.

Nevertheless, research on the issue is not particularly concerned with testing the extent to which man experiences the potential informational content of man-made environment; especially with respect to its richness, as this has been identified in the first part of this study. Most of the experiments and field studies conducted do not approach cognition in its own right, or in its relation to man's basic needs (see 2.0), but rather as referring to a particular

activity performed in space. Hence, the features in the image of the city tend to be seen in as much as they provide cues for way-finding (see 3.1 and 3.3.1), the meaning of a particular space is approached in its relation to man's purposive behaviour in it (as, for example, in Woots and Canter, 1970, p. 144), and so forth. With reference to research conducted in environmental psychology, Mehrabian and Russell write that "environmental psychology has been concerned with two major topics: the emotional impact of physical stimuli and the effect of physical stimuli on a variety of behaviours such as work performance and social interaction" (Mehrabian and Russell, 1974, p. 4).

Although it lies beyond any doubt that instrumental cognition is of evident significance to man, the interest here is in testing which social relations out of the whole range of the environment's potential informational content, are actually experienced. The studies mentioned above pointed out at the fact that, with reference to table 1.3, cognition is basically expected to occur at the first identificational level, while certain aspects of the second and third level are also expected to be experienced, as long as they relate to man's purposive behaviour. The question that remains unanswered is what happens with the rest of the environment's potential informational content; does it only exist without being utilized or does it merely have to refer to the needs of instrumental cognition to be experienced.

It appears that to conduct an experiment aiming at identifying

which of the possible varieties of cognitive experience actually do take place in real life situations is an exceptionally difficult task. What can be observed in the studies mentioned above is that answers given by the interviewees may well be functions of their broader understanding of the environments they live in - i.e. the broader image they have acquired from their environments. For this reason, even when the object of research is becoming particularly specific (as, for example, in Lynch and Rifkin, 1976), the fuller dimensions of momentary cognitions remain concealed. The issue is further obscured by the fact that a certain portion of cognitive experience tends to occur below the threshold of consciousness, especially in cases of familiar environments (Smith, 1974, p. 33). Although there is evidence to suggest that subliminal stimuli may even determine ongoing perceptual experience (Dixon, 1971, pp. 29-64), it is highly unlikely that any interviewee is able to give an account of the mental schemata triggered by such stimuli.

In view of the above, one is forced to adopt a more phenomenologically inclined approach. In this, subjective experiences of particular individuals are to be examined with reference to specific objects. Since the interest is in examining what social relations out of those stored in man-made environment in the process of its shaping are experienced, the approach will not be concerned with fourth level cognition. It is clear, however, that this separation is not always possible. As people project to some extent,

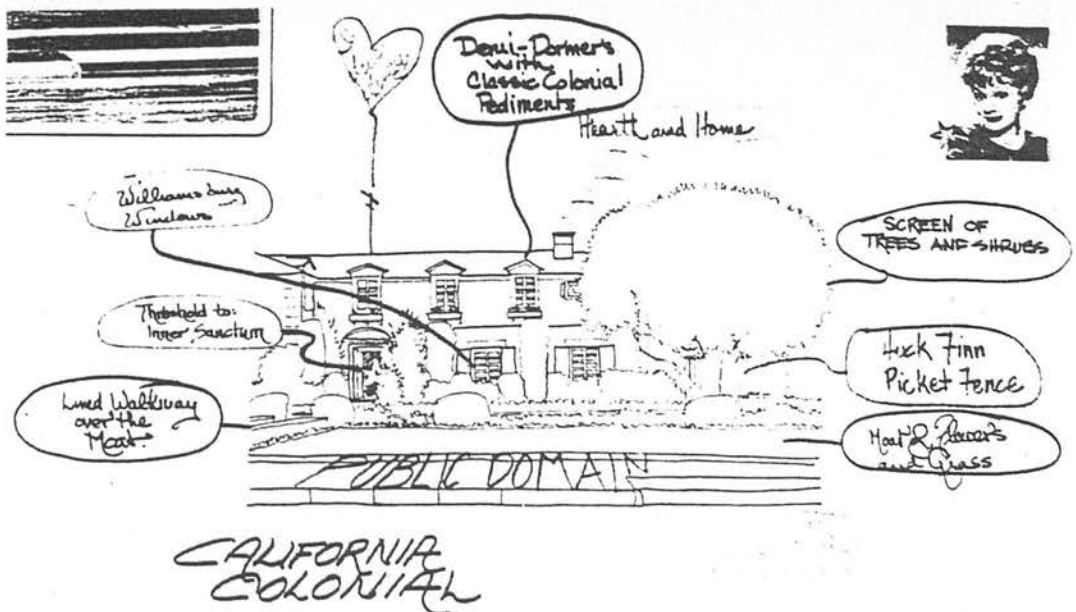
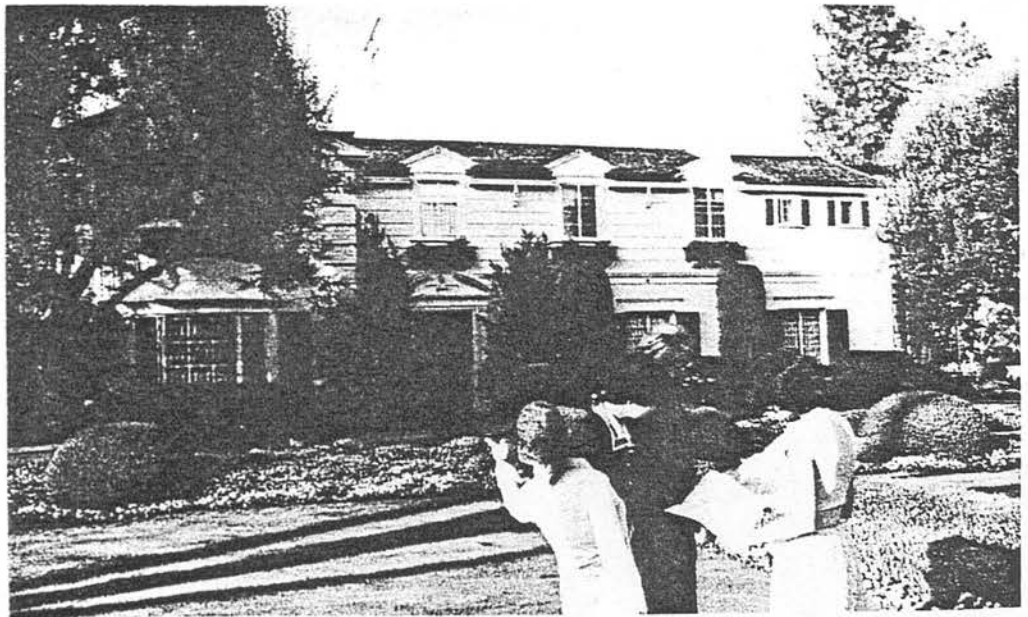
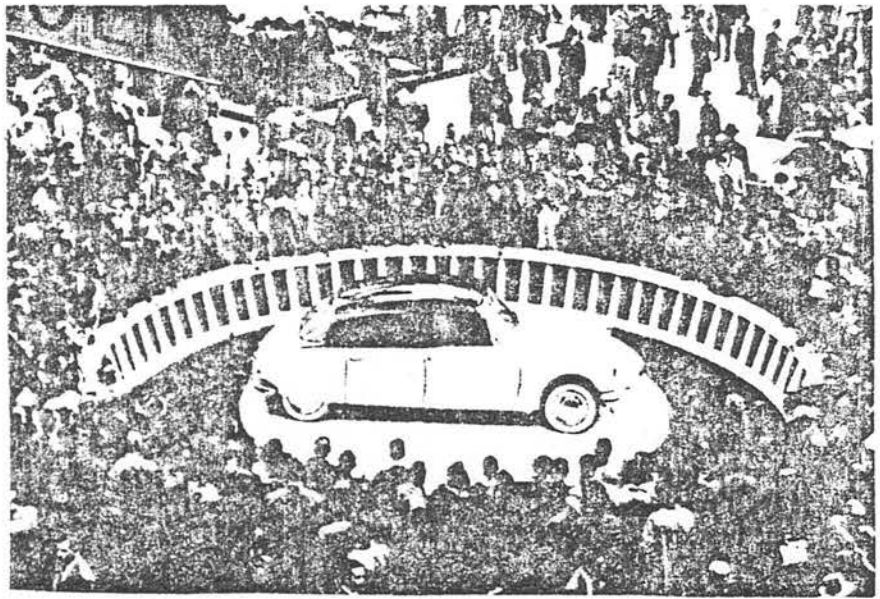
their "mental set" in objects they experience, the outcome is theoretically liable to include, at least, some fourth level cognition.

With reference to social relations of the ideology of the function (i.e. connotational), Roland Barthes unfolds his reflections of the launching of Citroen's DS Model (Fig. 46). He writes that he experienced its smoothness as "an attribute of perfection because its opposite reveals a technical and typically human operation of assembling" (Barthes, 1981, p. 88).

Similarly, when Charles Jencks discussed his cognitions of Beverly Hills star houses, he firstly referred to the sign of status transmitted to him by the historical origins of the style of most houses. Furthermore, his experience of smaller elements in such a mansion, and especially the chimney, door, landscaping and elements of the street point out at the seclusion of a rich, yet "human and homely", star in view of an "ordinary" public domain (Jencks, 1981, pp. 56-8; Fig. 47).

Historians' cognitive experience is also bound to contain cognitions of social relations which lie deeper than what may be regarded as the surface. A measure of Panofsky's and Giedion's interpretations were given in the preceeding part of this study. In "Art and Technics", Mumford describes three paintings, three nudes painted in different epochs (Middle Ages, Renaissance, and nineteenth century), and comments that such artefacts may enclose the maximum of meanings (i.e. deep second and third level social

FIGURE 46



Lucille Ball's mansion and Jenck's comments on its signification

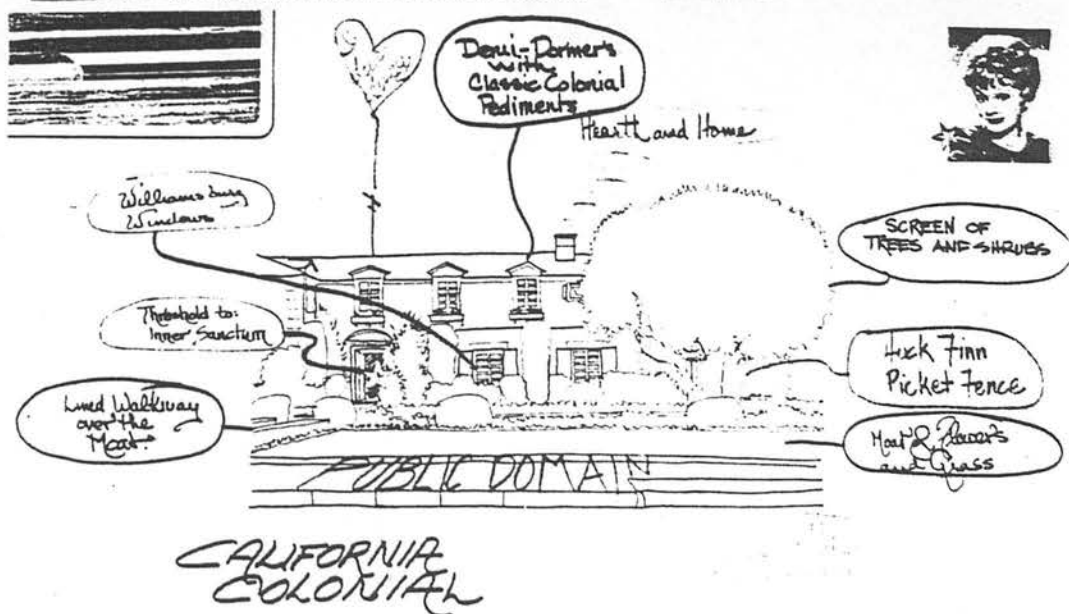
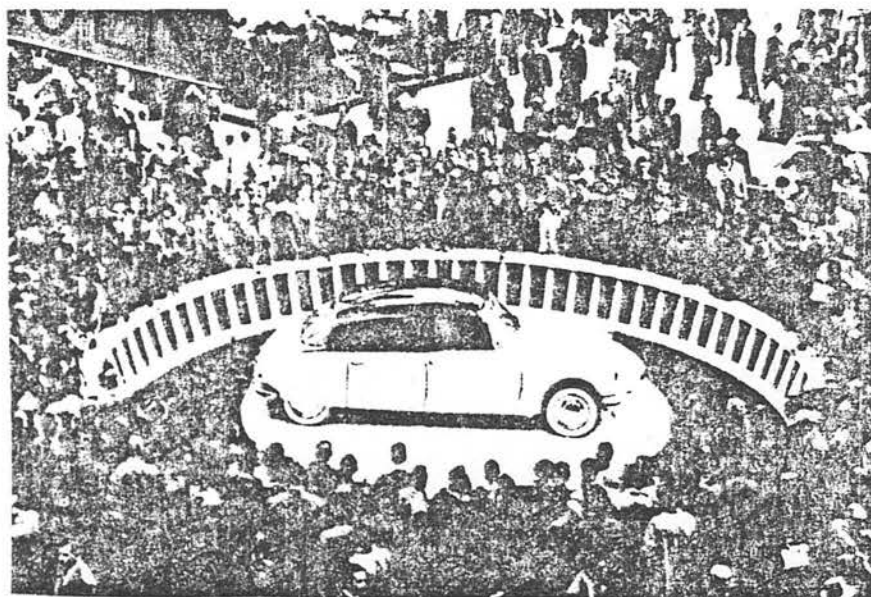
FIGURE 47

relations) with minimum materials. "In these condensed aesthetic forms, we find three different ways of looking at the world, three different philosophies, three cultures not just three women" (Mumford, 1952, p. 20). It may not be surprising that, in view of such cognitions, another historian, Cloag, proposed an architectural interpretation of history. In this attempt, what he found of particular interest was the understanding of how specific environmental forms managed to survive through the ages by means of the changing significance of their existence. Deep second level cognitions in a cross-cultural and cross-temporal perspective are persistent throughout the discussion (Cloag, 1975).

As cognition is, to an extent, a learned process*, it lies beyond any doubt that the writers above were trained to decode the objectifications of social relations in man-made environment. A similar remark can perhaps be passed with respect to artists (Fig. 48) and writers of imaginative literature (like those examined by Eco, 1972, and Tuan, 1976) who are particularly noted for the variety and complexity of their cognitions. The experiences of such individuals indicate that, given the circumstances, it is possible for the widest as well as the deepest dimensions of the environment's potential informational content to be cognited.

* The views of psychologists, as regards this issue, remain unresolved since the problem lies at the core of the argument between the two philosophical traditions. However, the stance that a large part of cognition, rather than all, is learned is not in dispute.

FIGURE 46



Lucille Ball's mansion and Jenck's comments on its signification

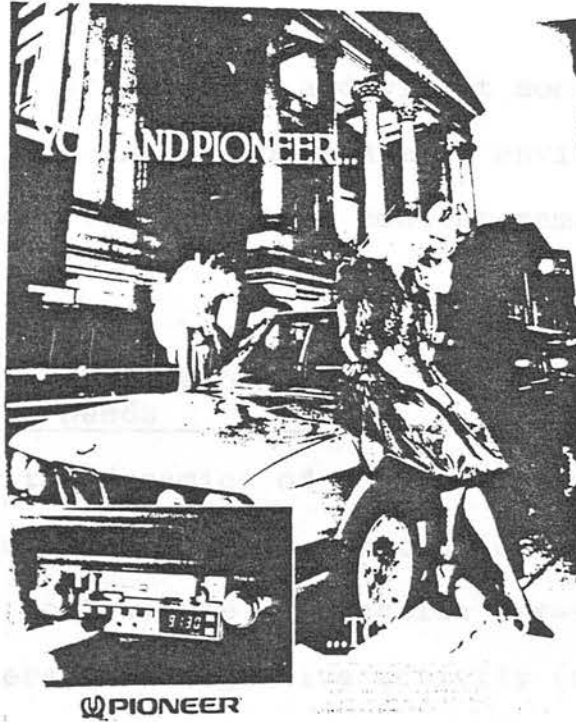
FIGURE 47

To see how people, who are not particularly trained may decode social relations from man-made environment one should take a look at how intensional communication of such messages takes place in everyday life. For the fact that such systems of communication repeat themselves and keep recurring, it can be drawn that man does go beyond the surface in his cognitive experience of environment. In Malaspinas's (1981) and in Duncan and Duncan's studies (1976), for example, it has been shown that particular elements were incorporated in environmental forms in lower class areas so as to communicate the users' aspirations as regards their class and group memberships. Such elements were most probably experienced as connotational by other inhabitants of the area (see 1.2.4 and Figure 32).

Similar observations may be drawn from other forms of everyday life communications, such as advertising. Promoters of car stereo equipment incorporated in their advertisement features such as luxurious clothes, a fast cosmopolitan car, and, above all, an impressive entrance to a building appropriately lit and reminiscent of the Monte Carlo Casino (Fig. 49). Without any verbal clues referring to status, advertizers are almost certain that anybody in the western world will cognite the connotational message they wished to convey.

It appears from the above that there is some evidence to suggest that the possible varieties of cognitive experience which have been identified earlier may actually take place in real life situations. As cognition is to some extent a

FIGURE 49



learned process, such experiences are expected to differ between different individuals depending among other factors, on their familiarity over the way in which certain events have led to the representation of social relations on environmental forms. However, no absolute conclusion can be reached in respect to the levels at which people experience their environments. Heider's argument of causal attributions may well be applied to particular events and representations of social relations, but this does not necessarily mean that everybody experiences the whole range of the environment's potential informational content. The very nature of the problem does not make it possible for concrete formulations to be empirically proved; at this stage, it is only tendencies and possibilities that can be identified. For this reason, the "may's", which keep recurring with reference to such formulations, appear to be essential. Although there is some evidence to suggest

that cognition may refer to the deepest and widest social relations in the informational content of man-made environment, experiencing the whole range of this content remains a theoretical potentiality.

2.2.4 Cognitive Experience in View of Man's Cognitive Needs

An important dimension of the dynamics of cognitive experience of man-made environment is revealed when one considers man's cognitive needs. If one follows the distinction between instrumental and more generalized cognitive activity (see 2.1), it appears reasonable to expect that the nature of the needs to which such activity relates will have some effects on what aspects of the environment's potential informational content will tend to be experienced.

In this sense, it may be expected that in everyday goal-oriented behaviour (like that of the activities which are to be contained in spaces that designers create) the object of cognition will correspond to the question of what is to be used, avoided, negotiated and so on (see also Appleyard, 1973, for the idea of operational perception). Along with the evident need for first level identification of objects and primary functions, there may often be cases in which a person will have to choose whether there is a need to cope with a certain task or not, in view of the particular goal he has in mind. This clearly involves cognitions of the significance of objects and their functions and, in this sense, goal-oriented behaviour may be expected to require some second level cognition. In this, the significance of objects and

functions is to be assessed within the context of the particular activity.

Furthermore, purposive behaviour may be expected to ask for the cognitive experience of more social relations, like those which are connotational in nature and refer to the question of how something is to be treated. These social relations of the ideology of functions may have been objectivated in distinct isolated elements or spatial relationships and it may also be expected that, in certain cases, their representations spread over the whole range of an environment's features. When one is searching for a precise stereo system, he will concentrate on specific items in it, whereas in finding a peaceful room to study the holistic impression will basically matter. Although the latter case may seem to imply that all features in the environment played a role in instrumental cognition, it appears reasonable to argue that only a small part of the environment's informational content (i.e. what relates to the need for the activity of studying to be conducted peacefully) had to be experienced.

In view of the above, it seems logical to come to the conclusion that although cognition, which relates to man's operational needs, may refer to the whole array of features in the environment, it still does not tend to cover its potential informational content. The reason behind this is that information in the environment is not seen in its own right but in as much as it refers to the needs of the particular activity performed.

The scope of cognitive experience is widened though, when one takes into consideration other needs that induce cognitive activity or, at least, needs which, although they may not lead to such a motivational state, they may still be to some extent gratified by incoming information (see 2.1).

As noted earlier, man's safety needs can be regarded as operating along these lines. Although these needs may relate to the particular activity performed in space, they do not necessarily do so. As most psychologists would agree, safety needs are basic human needs and, in this sense, they may exist regardless of man's goal-oriented behaviour.

As man finds himself in society, the knowledge required is mainly knowledge of social relations and it may include any aspect of them; from trivial information about a thing, person or group of people to manifestations of society, and mankind in general. As has been earlier discussed, grasping the "feel of a place" through the re-activation of schemata of social relations which constitute the basic components of a certain situation, is an example of how the need for safety may be gratified. In doing so, a person must go deeper into decoding social relations from man-made environment. Depending on the situation, social relations of the significance of functions and the ideologies of people and the social framework (i.e. deep second and third level cognition) may be required. As this matching of external stimuli to mental schemata generally takes place below the threshold of consciousness, the significance of such cognitive

activity often tends to be ignored.

Similar observations can be applied to cognitive activity arising or referring to dissonance of the person's knowledge of the world and to curiosity, in the sense of exploratory behaviour initiated by the development of mental schemata in view of novel stimuli. Such cognitive experience may refer to any social relation from the whole range of the potential informational content of man-made environment. Since these processes are selective, in the sense that they are concerned with the acquisition of specific information they are not necessarily expected to aim at covering the whole content. Once cognition is freed from the demands of purposive behaviour however, it seems that it may refer to any social relations stored in man-made environment. Depending on the circumstances and the nature of the basic need it relates to (f.i. safety needs, adaptation needs, the need for consonance and so on), it can be directed to both the widest and the deepest dimensions of the environments' potential informational content. In view of this, it seems reasonable to suggest that, with reference to different people over longer periods of time, such cognitive activity will tend to cover this content in both dimensions. The issue is elucidated further if one follows the reasoning in Maslow's argument, according to which cognitive needs are seen as forming a small hierarchy of basic human needs, which, in his opinion, exist in their own right. After postulating the existence of such autonomous needs, Maslow proceeds by distinguishing need-interested (what he called "D-motivated")

and need-disinterested ("B-motivated") perception and cognition (Maslow, 1968, pp. 39-41). The function of D-motivated perception is to relate objects in the environment to our own needs. Since gratification comes from the environment (in the general sense of the word), it is necessary to pay attention to the world as it relates to us and to gain accurate information from it. He argues that this type of need-interested perception is typically sterile and classificatory.

When people have achieved a stage where they have gratified their lower basic needs (i.e. physiological needs, safety needs, needs of belongingness and esteem) to some considerable extent, Maslow maintains, they may be considered as "self-actualizers"; in other words, as living in a condition of "being" rather than of deprivation. Cognition at this stage, B-cognition, is need-irrelevant. Experiences are considered in their totality, in their own terms and not in terms of their usefulness or human relatedness. Maslow argues that, in the case of B-cognition, there is no attempt to force the object of experience into preconceived segments, but it is fully attended to with a receptive attitude. The standard polarities and dichotomies are transcended so that there is a fusion between selfishness and selflessness. Attention floats freely, so that the unique, the idiographic can be perceived. Thus, the world is explored and manipulated and cognition may be regarded as providing a basis for what can be termed as "peak" or "mystic experience" (Maslow, 1968, pp. 74-96, 213-4).

A similar formulation has been advanced by Fromm who argued that man's character is formed from the interaction between the socio-economic conditions of the society in which he lives and the potentials within him (Fromm, 1947, 1955). His character structure determines the way he perceives the world and he proposed two ways in which this may be done: reproductively and generatively. In reproductive perception the world is experienced according to what exists on the surface or what is supposed to exist in terms of the predominant social character. In generative perception, the world is enlivened and recreated by the person's spontaneous mental and emotional activity. This is not only achieved through the imaginary fourth level transformation of the image but also by going beyond the obvious meanings.

Fromm argues that while everyone is able to perceive in both modes, the relative weights of the two modes differ widely. When generative perception atrophies, the person becomes the stark realist who can not penetrate beyond the surface givens. Alternatively, when generative perception dominates, his cognitive experience may be totally distorted by delusions. According to Fromm, both extremes (realism and psychosis) are symptoms of sickness, and what is needed is integration, rather than a combination of the two modes of experience (Fromm, 1947, pp. 88-90).

While Maslow's distinction between D-cognition and B-cognition refers to stages in the development of the person's personality in respect to the relative gratification of his basic needs,

Fromm defines his dualism in a difference sense and allows any person at any time to perceive the world in an amalgam of his two modes of perception. Fromm's generative mode of perception, apart from being based on the exploration of social relations, objectivated in the perceived object, through second and third level cognition, is also closely related to fourth level cognition, i.e. the active or imaginary transformation of the image. Maslow's argument, in which B-cognition is regarded as exploring the situation in itself, as well as previously discussed cognitive activity referring to other types of needs, do not necessarily include such experience. Nevertheless, it is reasonable to argue that, the more instrumental cognitive experience is, the less the image is likely to be transformed.

It is needless to argue that both Maslow's and Fromm's formulations, which are based on the assumption that man is active not only with respect to his operational needs but also in his being-in-the-world, expand the scope of cognitive experience to the limits. By placing the interest in the exploration of the perceived object as an entity in its own right, Maslow is, in fact, proposing that, in the state of "being", man will not tend to confine himself to decoding specific social relations stored in man-made environment but that he may have a tendency to "read" such environments for the sake of knowing and understanding them. Provided that the codes, under which social relations become represented in the environment, are relatively known, a whole series of such social relations, which include notions of mankind in general,

may be unfolded and cognited.

From the above discussion, it follows that there is a certain relation between the nature of the need to which cognitive activity refers and the part of the environment's potential informational content that is experienced. In instrumental cognition, only a part of the content of table 1.3 appears to be needed. When cognitive experience does not refer to the particular activity the individual is engaged in at the moment, it may be directed to any social relations in the environment. For this reason, and even if it does not cover the whole range of the environment's potential informational content, it may be regarded as having a tendency to do so.

The viewpoint, assumed by writers such as Maslow or Fromm, which contains the supposition that in man there is an inherent need to know and to understand, gives clearer dimensions to the problem. Since in the condition of "being" the interest is shifted in exploring the world and situations in themselves, cognition is deliberately stretched to the limits of the potential informational content of man-made environment. In a similar sense, Fromm's generative mode of perception attempts to provide an explanation for cognitive experience which goes beyond the surface into deeper meanings. Such meanings may either be stored in the environment or they may simply exist in the person's mental world.

In view of the above, we can proceed to certain conclusions with reference to the argument that has been elaborated in

the preceeding section, i.e. to what extent can man be expected to experience the social relations in the environment's potential informational content. It has been noted earlier that, provided that man is aware of the codes under which social relations have been objectivated, he is theoretically capable of experiencing any of these. It has also been said that, although it can not be empirically tested that he does, there is evidence to suggest that certain individuals do experience social relations in man-made environment. These social relations have been found to belong both to the in depth and the in width dimensions of the environment's potential informational content.

The realization that man may have a certain need to know and to understand, which, whether autonomous or not, is distinguished from his operational needs, appears to be sustaining a tendency to experience more social relations than what is required by specific purposive behaviour. This tendency may relate to any social relation of table 1.3 and, hence, it may be considered as supporting the significance of the variety and richness of the whole range of the potential informational content of man-made environment. Nevertheless, it has to be noted that the inherent difficulties in testing both the exact state of man's cognitive needs and the way the environment is cognited, do not allow an absolute conclusion to be reached. In this sense, the above formulations can be no more than suggestive.

2.3 COGNITIVE EXPERIENCE AND MAN'S INTELLECTUAL DEVELOPMENT

After examining the proceedings which accompany the reception

of a single, theoretically isolated, environmental stimulus, it is of fundamental importance for this study to come to an understanding as to how the above is linked with the development of the individual's mental world. Such an attempt implies that the perceptual impact will have to be approached over longer periods in the person's life. Naturally, some periods may be more critical than others in as much as they affect the individual's process of individuation and this depends mainly on the developmental stage he finds himself in. Apart from re-establishing the role of schemata by putting them in a different context, the aim of this section is to show that single cognitions, like those of man-made environment, play a significant role in the person's process of intellectual development. Knowledge of the world is not simply attained by means of individual perceptions of the environment, as perhaps it might have been implied in the preceeding section. Instead, it is basically the result of a rather tedious, enduring process of intellectual development, in which the impact of trivial and apparently superficial cognitions appears considerably strengthened. There are two lines of approach to the empirical study of intelligence. The first, which may be called the statistical approach, capitalizes upon individual differences in tasks which, by general agreement, are held to require intelligence. Though primarily quantitative, this approach does involve qualitative considerations. The second, the qualitative approach, ignores individual differences and analyses intellectual processes within the individual in

the direction of bringing out the factors which affect them, and how they change qualitatively in development (Wright et al, 1970, p. 483).

In the qualitative approach, basically developed by Piaget, the main aim is to uncover the logical structures and to show how these develop from birth to maturity. Since in the present context the interest lies in examining the development of such inner structures, like mental schemata, Piaget's work may be considered to be directly relevant to this study.

The important concepts from Piaget's work, which elucidate the problem of the context in which cognitions take place, as well as how they are integrated in the individual's mental world, are those of assimilation and accomodation of incoming stimuli. It is interesting to note that, although certain aspects of his impressive body of research and findings were met with criticism (f.i. Flavell, 1978), the notions of assimilation and accomodation were practically left uncriticized.

Before entering into the discussion of how these two concepts affect the line of argument in the present study, it is essential to take a look at the way in which schemata are supposed to be organized in a person's inner structures.

2.3.1 Cognitive Structures

The separate cognitions of an individual are grouped to form larger cognitive structures i.e. sets of hierarchiized schemata which may contain social relations. Such structures

are formed on the grounds that the schemata incorporated therein relate to a particular subject, whatever the nature of this is. In this respect, it is evident that a person's mental world comprises numerous such structures with some degree of autonomy. These structures are essentially interrelated, one penetrating through and often being part of another, since they may be as varied as "9th Century Russian Art", "the sky at night", "my grandmother", or even, "the feeding of melancholy".

How separate experiences are grouped to form structures is determined by environmental and personal parameters (in this case the person's past experience and motivation). Temporal conditions and variables, such as the state of mind and the person's course of action at the time, do not affect the process significantly since such grouping in structures occurs over longer periods of time. Piaget writes that, in the earlier stages of intellectual development, schemata in cognitive structures are relatively few and simple whereas at the higher levels of intelligence they are vast in number and hierarchically organized in complex groupings (Piaget, 1971, pp. 60-8).

In so far as individual experiences are culturally shaped, members of a culture will tend to form similar cognitive structures. This similarity will fluctuate depending on the degree of acceptance or consensus among members of a culture with respect to a particular structure. Thus, members of the same culture will tend to identify and classify specific houses under the cognitive structure "house".

The same people will identify a hut as a "hut" rather than a "house", whereas the person living there may probably have developed a different cognitive structure which would allow his home to be included under the heading "house".

Cognitive structures are not only formed in respect to isolated, identifiable objects as in the case of a house. They may refer to abstract or concrete conditions, aspects of situations and so on. Let us consider "the city at night" as a structure. Everybody has experienced the city at night repeatedly in the past and has inevitably developed a number of cognitive schemata relating to this situation and forming the relevant structure. This system may be expected to contain schemata such as "people generally don't work at night", "one goes to bed at night", "when floodlit, St. Paul's Cathedral becomes the impressive landmark it deserves to be", "the night generally is the time for entertainment", "last night we had a wonderful time", "the commercial centre is pitch black by now and is an awful experience to be there" and so on.

Man's mental world is typically made up of such structures. It is clearly impossible to find a single cognition "living a life of its own" since all schemata are integral elements of, at least, one cognitive structure.

2.3.2 Assimilation and Accomodation of Experience

The concept of cognitive structures and their role in describing the structuring of the individual's already attained experience of the world, do not explain the long -

term impact of perception by themselves. They merely provide us with an explanation of the context within which novel cognitions are to be incorporated. The whole process would appear to be a mechanical procedure of cumulative storage in a predictable static manner were it not for the operation of Piaget's functional factors of assimilation and accomodation (Piaget, 1971, 1971a, 1972). Instead of referring to an external bond between associated elements - as the behaviourists' conception of association did - Piaget's view regards cognition as a process in which incoming stimuli and fully integrated within the existing structures.

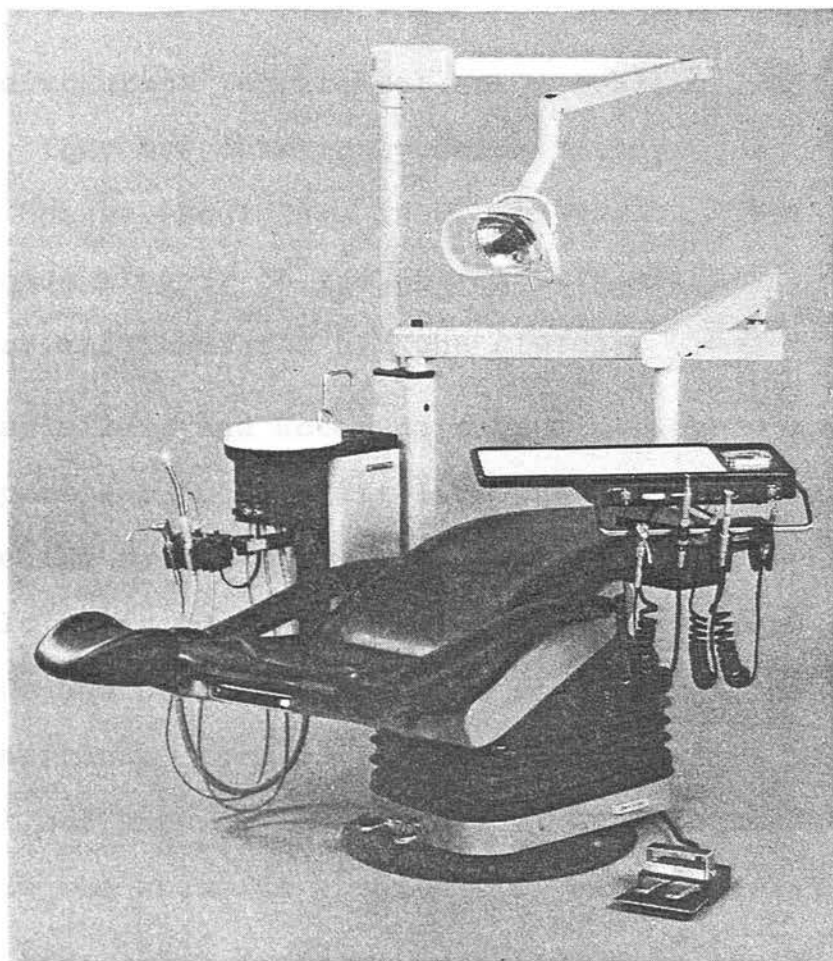
Assimilation consists of taking in stimuli and "translating" them by the means of relevant structures acting as programs. Accomodation, then, represents the other side of the coin. While an environmental input is being altered (cognited, defined, appraised) by the structures in the person's mental world, these structures and, consequently, mental world in its entirety are being altered by input; the latter function constitutes accomodation.

Assimilation ensures continuity and stability in the face of a complex and changing world, while accomodation leads to the changes in inner structures needed for adaptation to new circumstances. Over a period of time, accomodation of cognitive experience shapes the individual's trait-like characteristics, and through these, his personality by acting directly or indirectly on his already gained experience of the world, his value system, his motivation and aspirations in life, and so forth.

But let us first start with an elementary illustration showing the basic principles of the two processes in operation in a case of, basically, first level cognitive experience. When one perceives an object one has never seen before as such, like say, a dentist's chair or a collapsable chair (Fig. 50), several structures of schemata from the memory banks are activated to be juxtaposed to environmental input. As noted above, the vast majority of environmental forms, however novel they may appear to be, will always somehow relate to some cognitive structures in people's past experience. In the case of the chair, one expects this relation to be established on the basis of social relations having to do with its primary functions and its ideology (see also Seymour, 1979, pp. 217-99).

As cognition occurs, the object is assimilated by the means of schemata of relevant structures. That is, several schemata manage to get through, decipher the codes which link social relations with their objectifications in the particular chair and match themselves with these social relations. Finally, an object, which a couple of seconds ago was a "non-event", as far as the percipient is concerned, now has some "substance" for him being attired with meaning, such as "chair", "specialized use", "full of gadgets", "a lot of human thought and effort invested in it", "lush high-tech industrial design", "it must be very expensive" and so on. Accordingly, it may also be attached with various feelings accompanying cognitions, as well as possibly rational evaluations, such as, "Poor dentists! They need a fortune to

FIGURE 50



go into private practice". are capable of hindering the normal

All this new cognitive experience does not stay inert, but is incorporated in the activated structures. For example, the system "chair" and its schemata are widened and enriched with new evidence. Similar specialist's chairs will be more readily identified while at the same time the percipient will be easily prepared to realize certain social relations that go along with a certain profession. Possibly, notions such as "a chair is a solid, unbreakable object", or "it is unfair that I had the hardest time in the world to afford the furniture in my private office as a gynaecologist", might have to be relived against new experience and, perhaps, be dropped. On the whole, schemata are forced to become less

abstract and more accurate representations of reality, while, at the same time, they are constantly being "threatened", of revolutionary change (Boulding, 1956, pp. 7-8). This function corresponds closely to the notion of "paradigmatic" shifts in sciences as elaborated by Kuhn (1970).

The ability to assimilate and accomodate varies largely and this depends on personal (both trait-like and temporal) as well as environmental parameters. Eco writes that "perhaps an architect could build me a house that would defy every architectural code and perhaps this house would permit a pleasant and 'functional' form of inhabitation; but it is clear that I will not know how to inhabit it as intended unless I recognize the house as a context of signs referable to a known code (Eco, 1980, p. 20). Discrepancies in two individuals' personal parameters which may result to undecipherable objectivations are capable of hindering the normal function of assimilation and accomodation, and as a result, of causing both operational and deeper psychological problems (see also 2.4, 3.2 and 3.3).

On the other hand, flexible and unbiased schemata, paired with conscious learning through training, may become remarkably competent to assimilate social relations on many different levels. A possibly extreme case of this can be met in the legendary figure of Sherlock Holmes as far as cognitive experience is concerned.

As noted above, however, assimilation and, expecially accomodation of experience can be seen more clearly if they are approached over longer periods of time. As bits of

experience are stored in the memory banks of the brain, they may eventually be rediscovered and relived (possibly, but not necessarily) with the reception of novel perceptual input. In this sense, a certain "bit" of experience may have to take long to be "properly" assimilated and accommodated. Bartlett referred to patterns of schemata which underwent re-patterning when re-activated to be tested against novel stimuli (Bartlett, 1964, p. 196).

One may, therefore, think of the case of a person living for a certain period of time in a different social context. Not as a tourist, as this would imply certain special characteristics for the environment (approached by definition, in this case, as a "spectacle") and force the relation to function at another level, but as an ordinary person whose main occupation is not the contemplation of his surroundings.

As is generally the case for such a person, cognitive structures like "a town", "a given social context", "people in the street", or simply "buildings", will have been fairly developed in terms of accuracy. On the other hand, the specific cognitive structure "this particular place, its context in terms of social relations, and my attitude towards it" is expected to consist of schemata of considerable abstraction if one supposes that it is rather based on general descriptions and information "about" the environment than on first-hand experience, as is usually the case.

The person's ability and, of course, interest in assimilating and accommodating perceptual experience in the long run depends, as noted, on both personal (in the form of culture, personality traits and so on) and environmental parameters (e.g. clarity

or monotony in the way social relations are objectivated in the environment, see 3.3). The specific structure relating to the particular place will be enriched through assimilation and accomodation as far as first level cognitive experience is concerned. Because of operational needs, the individual will have to be able to identify bus stops, his place of work, eating places and so on.

But experience does not stop there. Once the person becomes familiar with the vocabulary according to which social relations have become objectivated in the given context, he will eventually be expected to deepen his experience to the second and third level. The degree to which this will happen is a function of his ability (and interest) to assimilate and accomodate and there appears to be an interaction between the two sides of the function. The increased understanding, along with a possible change in attitude, will allow him to re-assimilate experience and invest environmental forms with more balanced meaning. A number of field studies indicate a strong probability for such an increase in understanding (f.i. Steinitz, 1968, Pocock and Hudson, 1978, p. 24).

The result of going deeper into experiencing social relations in the environment in a more generalized form (e.g. the locals' attitude to work and entertainment) implies unlocking and activating structures concerned with matters (whether knowledge, values or beliefs) of increasing significance to the individual. As assimilation and accomodation may occur in a circular retroactive manner, some "bits" of experience

may take considerably longer to become consciously accommodated at such a level. The fact that schemata of such significance are re-discovered and, whether strengthened or modified, will become less abstract and more accurate constitutes a cornerstone for the link between cognitive experience and the development of the person's mental world.

It is interesting to note how contemporary research in psychiatry may come in relation to this argument when applied to man's perception of the built environment. Recent studies have provided the evidence to sustain the supposition that a language system, which does not contain a variety of concepts and meanings in all their subtleties, may effect a cruder form of communication between people. Subsequently, this may effect in mental retardation and maladjustment (Rutter, 1978). To the extent that this finding can be applied to man's cognition of the richness of the environment's potential informational content, it appears reasonable to suggest that man-made environment may not offer the possibility for a variety of schemata to develop. This is not meant to imply that the built environment can determine a person's intellectual development; yet it is clear that it is possible for it to come as a factor in this direction.

Adaptation and the Functions of Assimilation and Accomodation

As it can be seen from the above, assimilation and accomodation are complementary; one cannot occur without at least some of the other. Not only environmental input results in at least

a small change in a person's inner structures, but also no learning or any kind of change in these can occur unless there has been at least a partial assimilation of new material (see also 3.3.2). When assimilation and accommodation are balanced, behaviour is most adaptive, but such an equilibrium is not the usual state. It is the mere temporary end of a developmental sequence from a less mature stage to a more mature one. This notion of moving towards an equilibrium that itself is dynamic and unstable is a basic axiom in Piaget's theory (Piaget, 1971, pp. 2-37 and p. 171F; see also Hyde, 1970, pp. 24-29). Development, then, consists of a sequence of stages, each starting with an imbalance and ending with a temporary equilibrium.

There are two kinds of imbalance that involve assimilation and accommodation and influence perception in its potency as a vehicle in the direction of the individual's intellectual development. In the first, assimilation dominates accommodation. This is the case in which only stimuli consistent with momentary interests are attended to, with the result that thought processes are self-centered and unrealistic. Cognitive processes are too subjective failing to take account of the complexity and flux of the environment. When one perceives the environment - and, in this case, this may become increasingly unconscious - one does so with the eyes of personal bias, one relates it to strict, rigid schemata (being incompetent to integrate novel social implications to them) and jumps to arbitrary conclusions.

In the second kind of disequilibrium, accommodation dominates

assimilation. Stimulus inputs trigger change in cognitive schemata, and the whole of mental world, too easily and behaviour may become imitative. This imbalance may eventually lead to imaginative situations (imitations of present persons, deferred imitation and, finally, mental illusions). The problem has been raised by R.D. Laing when discussing the "false-self system" (Laing, 1971, pp. 125-50). This denial of self can not last long and only an increasing tendency to assimilate, and consequently "assert" the self, may lead to an equilibrium.

Although these two kinds of imbalance can be seen to occur over longer periods of time, they may also be regarded as being potentially "there" at any time as the equilibrium is dynamic and unstable. This appears to be a function of the person's trait-like characteristics as well as his state of mind at the time.

To recapitulate, assimilation and accomodation can be seen as being functional factors in perception in a twofold manner. On the one hand, by relating perceptual input to the development of the person's inner structures, they give a picture of the context in which experience occurs while, at the same time, they explain how it is integrated in man's mental world. In this sense, single cognitions of the man-made environment may modify, strengthen, or alter mental schemata, cognitive structures and the person's mental world as a whole. On the other hand, by relating esoteric changes to the way the environment is experienced, they provide an explanation for the form man's cognitive needs may attain as a result of the development of his mental world.

2.4 THE FORMATION OF GROUP IMAGES

Once the understanding of the occurrence and importance of cognitive experience has been established for the case of a single individual, the question that arises is what characterizes group images. Evidently, the designer is very seldom concerned with a single person's image of the objects he designs, since such objects are generally brought to life to appeal to wider and more complex groups of people. This is typically the case for the urban environment. Therefore, the understanding of the way in which the environment is likely to be experienced by groups of people, as mixed and varied as, say, city dwellers may be, is of essential importance in the urban designer's profession.

From what has been elaborated in the preceding sections, it follows that the particular way a single individual experiences his environment at any given time is dominated by the particular formation of his personal parameters at the time (i.e. his past experience and motivation, his state of mind and course of action at the time). The variety and diversity of mental schemata, which may be activated in perception, provide the potential for remarkably different experiences. In this sense, momentary perceptions of the environment are in their entirety idiosyncratic and unpredictable, (Pocock and Hudson, 1978, p. 33).

This may be so even when the same environment is experienced by the same person, no matter how often this happens and will happen (e.g. a person leaving his front door, in the bus on his journey to work and so on). An illustration of this

point is provided by Rapoport who refers to the main quadrangle in Sydney University. Even after years of experiencing it and knowing exactly what to expect, the impact remains and is sustained by changes in scale, enclosure, light, colour, mood, sound quality, the lawn and tree, the weather and time of day and so on (Rapoport, 1977, p. 217; Fig. 51).

If the problem is as it appears to be at a first glance, then there is hardly a way of predicting how a certain environment will be experienced even for a single person. In that case, the designer who is concerned with the image of the objects he creates would seem to be faced with a hopeless task. Nevertheless, although it is impossible to understand what a person's momentary image of an environment in its entirety may be, it is still feasible to forecast some aspects of it.

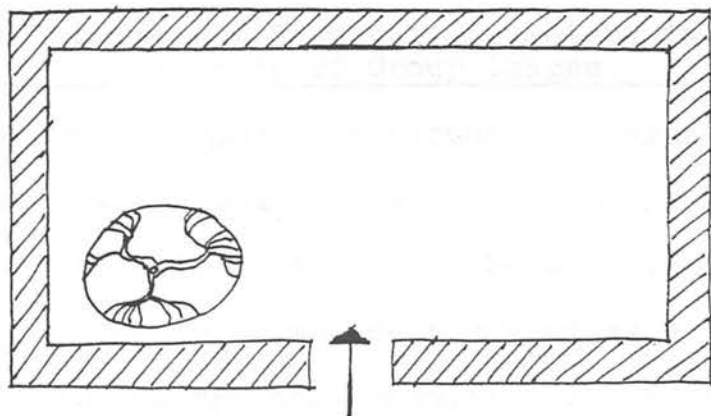


FIGURE 51

The interests of the present study as regards the formation of group images of man-made environments are centered in the examination of basically two aspects of the problem: one concerning the functions involved and the other concerning the content of the image. In this sense, the first issue relates to the identification of the functional qualities of personal parameters in cognitive experience of man-made environment. The second issue is concerned with the actual message and the question of how may one come to certain clues as to what a group image may be like.

It should be made clear that the interest of this study does not lie in measuring group images or in examining the figurative aspects of them alone, knowledge of the form of cities. In view of the potential informational content of man-made environment, what has to be examined is whether they may be some groupings, in the factors influencing perception, which may help in predicting certain aspects of group images. For this reason, what is needed is a broad overview of the factors involved.

2.4.1 The Function of Personal Parameters in the Formation of Group Images

Let us now consider people's personal parameters and, especially, how these may relate to each other in case of more than one individuals. As it has been elaborated in 2.3.1, a person's mental world may be regarded as being grouped in a complex set of interrelated cognitive structures. Although individual prior experiences of the world are, in their entirety, unique, the structures they relate to may be regarded as tending to be shared (at least in their basic components)

among different people. The extent of this spreading depends on the nature of the structure, on the one hand, and on the individual's social environment (e.g. position in society, age, class, culture, etc.), on the other. Reversely, various groupings, sub-groupings and cross-groupings of members of a given society will be expected to present similarities in certain cognitive structures of individual mental worlds. Such similarities or differences are expected to provide some clues for the prediction of the understanding of the codes which link social relations to environmental forms. The group, say, of antique dealers will be expected to be able to identify a much more extended set of social relations represented on certain objects than what the average person would.

A measure of image variation with people's past experiences can be traced in the drawings of mental maps of cities as these were experienced by members of different subgroups. As such pictures are functions of people's images, one may see how people depict elements (and social relations) they know more. The nine year old child emphasizes his home and school, the student, the university buildings, the tourist the city centre, while long-term residents have a more balanced, although different cognition of their city (Pocock and Hudson, 1978, p. 66; Fig. 52).

From the above study, as well as from similar ones like those mentioned in 2.2.3, it can be seen that, whatever the degree of variation in image formation, it may be expected that there will always be some consensus, provided

that there are similarities in people's prior experience of the world. In this sense, when one refers to a given society, a fair amount of codes of representation of social relations on man-made environment is shared. This constitutes an additional reason to strengthen the significance of analyzing how sources of potential information are embodied in the environment in the process of its shaping.

A state of some concensus may again be reached as regards people's motivation or state of mind at the time of perception. Apparently, the latter may be more effective in the formation of momentary images. In this sense, people may statistically be expected to be in similar moods in environments such as holiday resorts, entertainment places or certain environments, which because of their nature, may induce peak experiences. Similarly, motivation may also be based on elements, such as wants or instincts, which originate from the unconscious. Although such elements may be expected to be shared among different people, their expressions in the form of motivational states may only occasionally result in similarities in cognition. Nevertheless, certain forms of motivation may apparently be shared in a more identifiable manner and, therefore, can be seen to lead to a somehow distinct grouping of the image.

In the illustration below, the replies of two sample population studies in the city of Hull, resident and outsider, are juxtaposed (Burgess, 1974).

Both groups made a few common selections from an adjectival checklist of 48 items, but only the city's inhabitants

Mental maps of the city of Durham illustrating the different perceived worlds by different subgroups;

a: Nine year old child

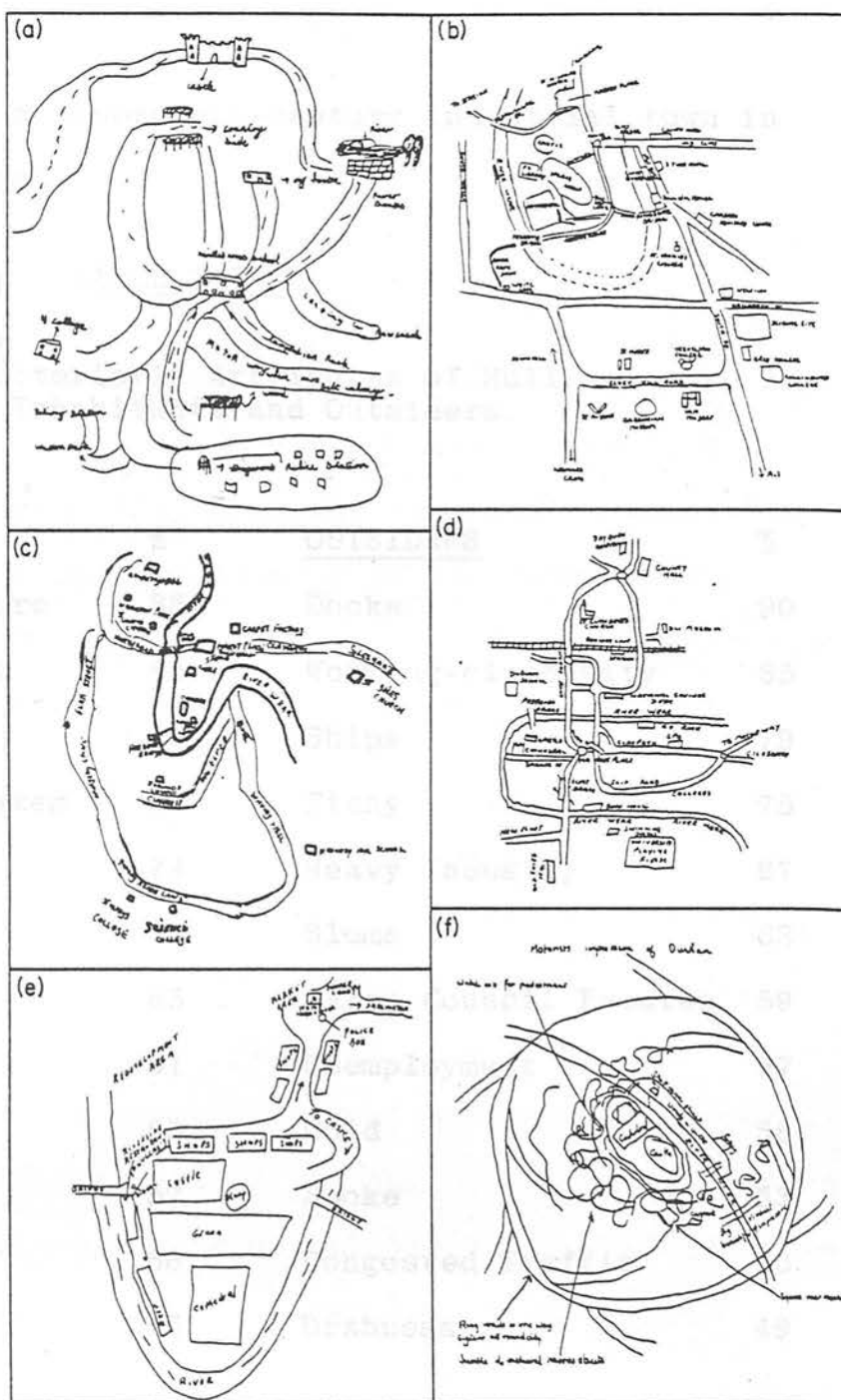
b: Final year undergraduate

c: Resident, working class

d: Resident, middle class

e-f: tourists

FIGURE 52



emphasized elements of general structure, such as "shopping facilities" and "redevelopment", or positive affection, for example "friendly" and "parks". Outsiders' motivation and predisposition was markedly different (along with obvious differences in their past experiences). They emphasised the negative attributes ("heavy industry", "unemployment", "slums", "smoke", etc.) and they were actually presenting

the stereotype of a nineteenth-century industrial town in the north of England.

TABLE 2.3.1

Leading Characteristic Attributes of Hull as Perceived by Inhabitants and Outsiders.

<u>INHABITANTS</u>	%	<u>OUTSIDERS</u>	%
Good Shopping Centre	85	Docks	90
Working-class City	84	Working-class City	85
Docks	81	Ships	79
Large Council Estates	75	Fishy	75
Friendly	74	Heavy Industry	67
Trees, Parks	74	Slums	63
Ships	65	Large Council Estates	59
Low wages	61	Unemployment	57
Fishy	58	Cold	56
Congested Traffic	57	Smoke	53
Tower Block Flats	56	Congested Traffic	50
Redevelopment	55	Drabness	49

(from Burgess, 1974).

As regards people's course of action at the time of perception, it has been already discussed how cognition may depend on purposive behaviour when it becomes an operational need in response to it (see 2.1 and 2.2.4). Yet, this parameter may be seen as being extended on whatever the main occupation of body and mind may present. In this respect, different, fairly clear, patterns are likely to be formed depending on

the nature of the occupation, the extent to which it involves the conscious mind, the emotions it may evoke, the variety in angles of viewing the environment it requires and so on. Different patterns will tend to give different patterns of perceptual experience as far as diversity in the course of action is concerned (e.g. possible discrepancies in a typist's and a cleaner's view of the same office as a result of discrepancies in the positioning of eye-levels and perpetual viewpoints relating to their movement, or non-movement, in space when doing their work).

The overall view of the influence of personal parameters on perceptual experience seems to be pointing at the fact that although each and every momentary image remains unique in its entirety, there are still some ways of experiencing the environment that appear more probable than others for a given group of people. The above statement establishes probabilism as the characteristic aspect of the influence the environment has on people in terms of perceptual experience, at least as regards cognition in relation to people's basic needs.

There are certain analogies to be drawn between what is being discussed in this section as regards the way the built environment is experienced and the approach to the question of its effect on human behaviour. In relation to the latter issue, Rapoport summarized the three prevalent attitudes as follows:

1. Environmental determinism - the view that the physical environment determines human behaviour.
2. Possibilism - the view that the physical environment provides possibilities and constraints within

which people make choices based on other, mainly cultural, criteria.

3. Probabilism - the current view that the physical environment does, in fact, provide possibilities for choice and is not determining, but that some choices are more probable than others in given physical settings (Rapoport, 1977, p. 2).

Although overt behaviour may be considered to be a function of experience (Laing, 1967, p. 24) and therefore should not be confused with it, it appears that similar approaches or attitudes exist, in either a latent or an explicit form, as regards people's experience of man-made environment (Lang, 1980, p. 148).

The complexities of perceptual experience however do not allow an overall generalization of the way personal parameters function in perception to be formulated. Nevertheless it seems logical to come to a broad distinction arising from the nature of cognitive experience. Thus, on the one hand one tends to agree with Appleyard in his view that experience tends to be more deterministic when cognition is an operational need; although, even then, one may not have pure determinism, mainly because of the complexities involved (Appleyard, 1973). On the other hand, when cognition is freed from needs arising from purposive behaviour, then, certain groupings as regards people's personal parameters may turn some cognitions into more probable than others.

Finally, as the potential informational content of man-made environment may be extremely rich in social relations, it is

reasonable to suggest that the probability of experiencing a number of such social relations may appear very small. Although this probability is a function of personal parameters, the complexities in them and the possible richness of the content may make experience look as though it is a matter of chance. One could argue that such an element may, in fact, be involved in these cases. For this reason, it seems logical to suppose that, although experience of social relations in the environment is basically characterized by probabilism, it may fluctuate from determinism to possibilism depending on the circumstances.

2.4.2 The Content of Group Images

Up to this point we have discussed how people's personal parameters may operate as functional factors and influence the way perceptual input will be experienced. These parameters were seen as being particularly important in perception and a measure of this is shown by the fact that individual momentary images tend to be unique and idiosyncratic. What remains to be stressed in this section is the relative importance of environmental parameters as well as how can one come to some conclusion as regards the groupings of the content of cognitive experience.

It is interesting to note that, although a person may experience his surroundings according to the particular formation of his personal parameters at the time, this experience may only be drawn from the particular environment in which he finds himself and nothing else. And, although

one may often focus one's attention to one's past experience (images, thoughts, events etc.), this may not happen over longer periods of time and one must go back into experiencing one's particular surroundings. The same happens for every person in a shared environment, as is typically the case for a city.

Moreover, no matter how endless the amount of potential information in an environment appears to be, it can not be anything else but a finite rather than an infinite domain for experience. No two environments in this world can be characterized by identical environmental parameters and each one of them carries its own potential in the amount of possible information it contains.

This stimulus dependency appears to be easily confused with what schemata a person has already acquired from previous experience, whether direct or indirect, of his environment. In this sense, its significance tends to be limited to momentary situations (Moore and Colledge, 1976, p. 6). For cases of both immediate, stimulus-dependent and long-term experience, it has been argued that the form of environmental features may increase or decrease the probability of them being experienced; such is, for example, the case of imageability of features (Lynch, 1960) which may ask for responsive perception (Appleyard, 1973).

In the context of the present study however, it is essential that we proceed further into examining how different social relations embodied in environmental forms may be expected to

be experienced in view of what has been discussed in the previous section. In an attempt of pinpointing the areas of possible confusion over the perceptual input, it appears essential to examine the content of the message in the light of how an information channel operates.

According to information theory (Shannon and Weaver, 1949; Broadbent, 1973, p. 210) the function of communication can be broken down to stages as follows:

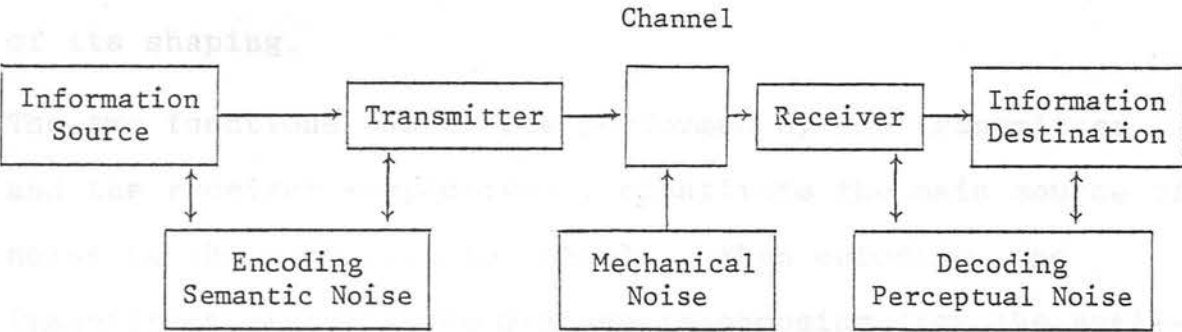


TABLE 2.4.2 (based on Shannon and Weaver, 1949, and on Broadbent, 1973).

The information source (e.g. a human brain) wishes to pass a message to the information destination (e.g. another human brain) so as to affect the latter's experience and modify its behaviour. This information consists of ideas, thoughts, concepts (signifieds) about people, objects and their relations (referents) which in the case of the built environment, have to be codified into perceivable concrete form (signifiers). This encoding corresponds to what in the first part of the study has been described as the objectivation of social relations on environmental forms. The difference lies in the fact that the above model, when seen as a whole, is concerned with intended communication. As noted earlier,

social relations may manage to become objectivated on environmental objects incidentally or with no direct intention for communication. In respect to this, the model of table 2.4.2, apart from being regarded as a whole when communication is intended, it can also be divided in its two component functions the encoding, or objectivation, and the decoding, or assimilation of social relations; this last function theoretically includes the totality of social relations represented on man-made environment in the process of its shaping.

The two functions, which are performed by the transmitter and the receiver respectively, constitute the main source of noise in the communication model. When encoding, one immediately distorts the message in choosing from the available list of signs. This distinction can be called semantic noise and it is a function of the person's personal parameters and the social context. An expression of such a distortion can be seen in cases where there is a lack of congruence between activity and spatial form, as for example in old tenements which are now used for storage (Steinitz, 1968, p. 243 and Fig. 53).

Having been distorted at source, the message will be subject to mechanical noise within the channel (e.g. smudged lettering, tea-stains on a drawing etc.) and, when it reaches the receiver, it will be subject to further noise. For in the process of decoding, as we have seen, it is highly likely that activated schemata will result in the attachment of rather different meanings of the signs from those which the



Churches converted into sports clubs (left, in Bridge of Weir) and Job Centres (right, in Portobello). Verbal signs have to be big and impressive to overcome the semantic noise caused by the building envelope.

FIGURE 53

source intended (as, for example, in the case of the toilet bowl or the Chandigarh residential quarters discussed in 1.2.4). But even if these meanings are similar, a certain distortion of the message will still (at least, theoretically) occur since schemata are, by definition, abstract representations of reality and the degree of abstraction varies with the individual.

The above sources of noise are in operation and may distort the message at any time during communication. As noted before, the body of social relations objectivated in the environment is not expected to be experienced in its entirety. To a certain extent, this depends on the source's personal parameters in relation to those of the destination and the resulting degree of sharing the vocabulary used in encoding. This aspect of group image formation can be predictable to an extent as long as the designer carefully considers how the recipients' personal parameters can be grouped. In this

sense, a mosque designed by European standards and incorporating European signifiers may probably be as meaningful to the Arabs as an advertisement in Arabic, posted in London, would be to the English.

But, apart from differences resulting from discrepancies in the sharing of the particular vocabulary used, several other aspects of the content of the message can be to an extent predictable as well. Considering once more the table in 1.3, one may see that an environmental object may contain information on three levels. Broadbent notes that, if the original signifiers carried largely denotational (either first, or second, level or, in other words "what is this" and "why does it exist") meanings, communication will tend to be accurate. But if they contained connotational meanings, then it is more likely that the decoding will result in meanings which are rather different from those the source intended (Broadbent, 1973; Rapoport, 1977).

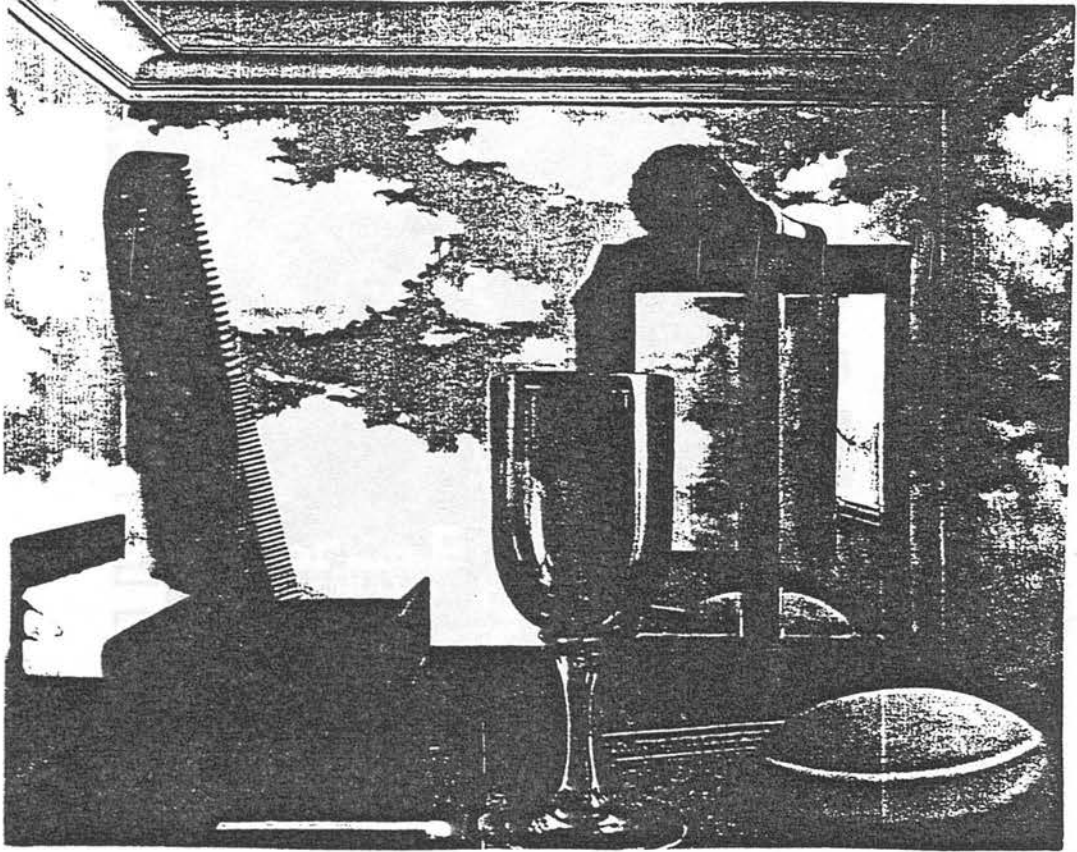
In his early work on "the image", Boulding used and defined the term "public image" as "the basic bond of any society, culture, sub-culture or organization" ("Boulding, 1956, p. 64). In view of this, it appears reasonable to argue that if such a collective experience was to rely on connotational meanings then it is likely that it would be diffused, since most members of a group would tend to interpret such meanings in their own personal manner.

In close agreement with this view is Venturi's criticism on how "the rhetoric of the image" works for the so-called International Style in Architecture. In his book "Learning

from Las Vegas", Venturi argues that, if designers keep designing for connotations and associations, there is a danger of losing our common language and shared experience (Venturi, 1977, pp. 101-62).

Taking another look at table 1.3 however, it can be noted that, mainly because of the extreme variety and multiplicity of factors affecting a certain primary function, connotational meanings are very important in the unfolding of the entirety of the potential informational content in environmental forms. Because of this richness contained in connotations and in view of man's cognitive needs, one may argue that such meanings are needed. The question then, is to ensure that they will be less abstract and more specific so that a fair body of them will be eligible of being shared to an appreciable degree.

A way to increase the probability of certain connotations being experienced along with denotations is through the juxtaposition of environments and social relations which would naturally belong to different contexts (see also expectancy in 2.2.1). In this manner, social relations of both contexts may be expected to stand out in perception as "colouring" and deepening first and second level experience. An interesting illustration of this point can be seen in the case of surrealist works of art; especially so, in legible paintings like those by Magritte (Hammacher, n.d.). The careful placing of objects in a context other than their usual surprises and attracts the attention of those who also contemplate the painting. When successful, the juxtaposition of objects



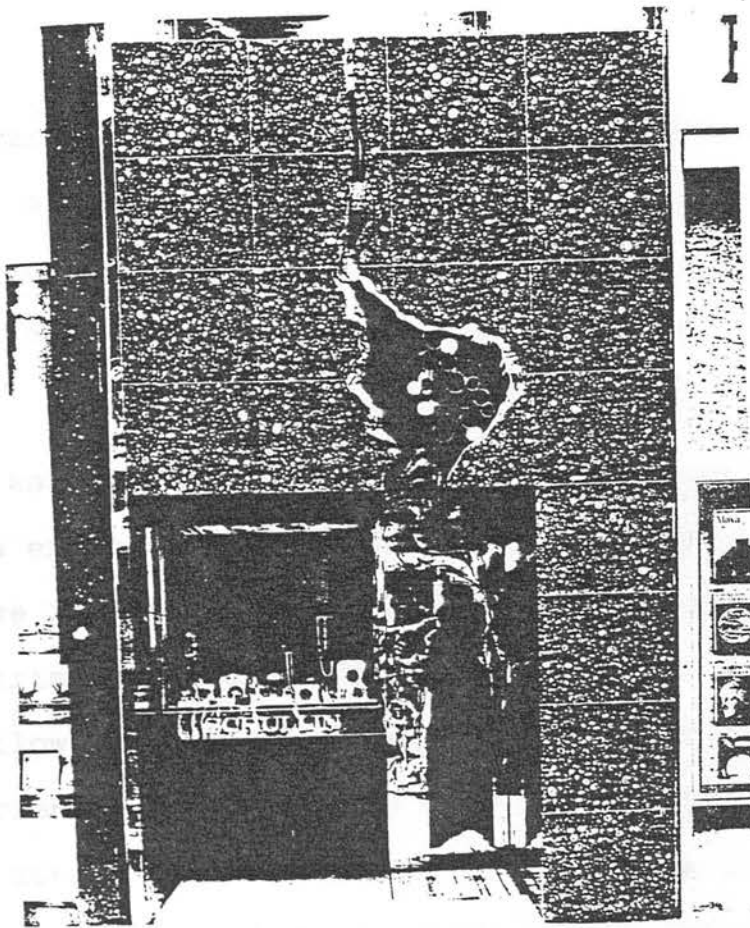
"Personal Values" by Magritte, 1952.

Using differentiation in dimensions as a basic code, Magritte develops the idea that every day objects, which normally are nothing but functional gadgets, may take over and dominate one's personal space, if one is not careful.

FIGURE 54

and contexts allows social relations which refer to how certain elements are used (and which tend to be taken for granted) to come to surface (Fig. 54).

Apparently, it may very seldom be asked from the built environment to incorporate shocking juxtapositions which seem to involve many psychic associations. Such a technique however, is often followed by architects who wish to be in the so-called Post-Modern Movement in architecture (Fig. 55). In its



Top: Jewellery shop, by Hans Hollein, Vienna, 1975.
 Bottom: Notch Project, by James Wines and SITE, Sacramento, 1977.

The environment of the, luxurious or not, shop - in all its social relations - is juxtaposed to one which would allow a wide crack to register, and stay, on the wall. Social relations of the ideologies of the primary functions of both environments are expected to be reconsidered.

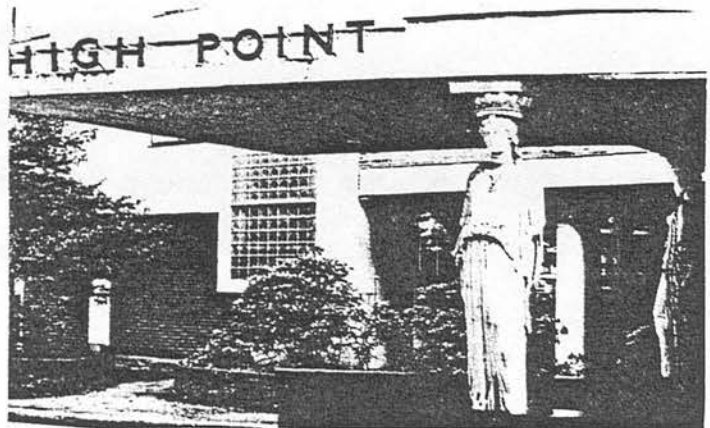
FIGURE 55

extreme manifestations, it may be argued that such juxtaposition of forms and contexts is more interested in making a point as regards the discussion on architectural issues rather than to satisfy the particular users' needs (see 1.2.4).

What is asked from designers, however, is not to destroy people's experiences or produce shocking effects, which may give rise to feelings of depression or alienation, as psychiatrists may argue, but to design in a direction which would allow both denotational and connotational meanings to be experienced smoothly (see also 3.2). Bearing in mind the way the users' personal parameters function in perception, one may expect techniques like the so-called "contextualism" (see Rowe, n.d. and Fig. 56) to operate in this direction. In

The Entrance to
"High Point II"
in Highgate (1938).

FIGURE 56



this sense, a careful juxtaposition of contexts will not only be expected to increase the probability of distinct connotational social relations to be experienced, but it would also preserve the unity of perceptual experience.

To recapitulate what has been discussed in this section, perceptual experience has been regarded as being dominated by

the individual's both temporal and more trait-like characteristics. In this sense, a momentary image will tend to be in its entirety idiosyncratic and unique.

Yet, there may be certain clues which may help to come to a grouping of such personal experiences, either in momentary terms or when seen in the long run these clues, which are to be found in similarities in people's personal parameters, turn certain cognitions into more probably than others. In this sense, the environment may be said to be experienced in a probabilistic way. Depending on the circumstances and the particular formation of people's personal parameters, environmental experience may be expected to fluctuate from being more deterministic (as in the case of purposive behaviour) to more possibilistic (when it is regarded as referring to the totality of the potential informational content of man-made environment).

Furthermore, by determining the extent to which the vocabulary of codes is shared, personal parameters provide clues in identifying what has been termed as semantic and perceptual noise in communication. Such clues may lead to an understanding of the actual content of people's experience of man-made environment. The main link between social relations objectivated in the environment and the perceived collective image appears to be first and second level denotational meanings and mainly those of the identification of objects. It is more probably for such information to be experienced at a group level rather than connotational meanings, although it seems logical to suggest that under certain circumstances (as, f.i.

in cases of juxtapositions of objects and contexts) the probability for connotations may increase.

2.5 CONCLUSIONS - THE IMPORTANCE OF THE COGNITIVE EXPERIENCE OF MAN-MADE ENVIRONMENT

In the first part of this study, the potential informational content of man-made environment, as this is embodied in environmental forms in the process of their shaping, has been explored. Analytical observation suggested that social relations, which were represented on environmental forms, could be exceptionally varied in amount and multiplicity as well as in width and depth. If one adds to this meanings that are being attached on environmental forms after they have been constructed as a matter of consensus of the social groups involved (see 2.2.3) then the potential informational content appears immense.

Where does all this information go? Is the representation of social relations a merely accidental and peripheral phenomenon amidst the complexities of the evolution of mankind or is it somehow utilized? And, if it is utilized, how important may this be for man?

The discussion in the second part of this study approached the issue in relation to man's cognitive needs. Although an absolute conclusion can not be reached because of the nature of the problem, there is some evidence to suggest that people do experience social relations from the environment's potential informational content. When cognitive needs are operational in nature, in respect to a particular activity, cognition is expected to be directed to a certain body of information so that the activity is sustained or facilitated.

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Further research, however, has suggested that the need to know may become a motivational state itself regardless of man's other purposive behaviour. Although this cognitive need may arise from various sources, as, for example, man's safety or adaptation needs, it has also been strongly argued that there is a case for an autonomous need to know and to understand in the form of a universal basic human need.

The realization that man's cognitive needs, whether autonomous or not, may be elevated at the level described above, allows cognitive activity to be seen as transcending the operational needs of the moment. Cognitive experience of man-made environment can then be regarded in relation to man's basic needs as a person and not only as a servant to man's purposive behaviour of the moment. This clearly opens the possibility of a much greater portion of the potential informational content of man-made environment to be

experienced as the object of cognition may be any social relation in the environment and not only those which sustain the particular activity performed in space.

If one accepts Maslow's view that, in the condition of "being" (in which man is supposed to have relatively gratified his basic needs), the individual tends to explore the situation in itself, then one may see that experience may deliberately tend to cover the limits of the content.

Piaget's notions of assimilation and accommodation of experience provide an explanation of the way in which conscious and unconscious cognitions become integrated in the individual's mental world. Apart from being kept alert, mental schemata become less abstract representations of reality, individual cognitive structures are evolving and the person's mental world as a whole develops with perceptual input.

When this is brought in relation to the richness of the environment's potential informational content, it becomes possible for man-made environment to be regarded as possessing a different quality than providing cues for man's goal-oriented behaviour. It seems reasonable to argue that if seen as a whole, cognitive experience of man-made environment is complementary to man's overall experience and understanding of the world. Man-made environment, then, constitutes an important domain from which this knowledge is acquired.

It appears necessary to disentangle ourselves from the supposition that environmental cognition leads to foreseeable

action, in order to arrive at this suggestion. The fact that a significant part of the experience of man-made environment in every day life tends to occur below the threshold of consciousness, is further confusing the matter by concealing its fuller dimensions. A role in this is also played by generic schemata which have to do with the primary functions of objects (such as words relating to the first level identification) and which are readily raised from memory to help the individual cope with a complex world. Such experience of man-made environment screens its subtleties and, consequently, neutralizes the dynamics of its potential informational content. Yet, as noted above, cognitive experience may be expected to be deliberately directed towards the fuller dimensions of this content.

What is meant by the suggestion that the man-made environment functions as a domain from which man acquires his knowledge of the world is not that the experience of social relations embedded in it comes as a revelation to a mind which is in a "tabula rasa" condition. Instead, one should note that, at some stage of his intellectual development, man has already acquired a certain set of cognitive structures. When cognition occurs, external stimuli are expected to have some point of reference with schemata in these structures, however underdeveloped and relatively few the latter may be. The discussion in this part of the study suggests that all what is experienced, and particularly what refers to the person's deeper cognitive needs, bears an effect on already existing mental schemata, cognitive structures and the

person's mental world as a whole. In this sense, schemata are strengthened, modified and, possibly, altered with incoming stimuli. As noted earlier, subliminal perception plays an important role in this so that the world does not have to be "rediscovered" from scratch with every cognitive experience. For this reason, the suggestion that man's experience of man-made environment is complementary to his overall knowledge of the world is based on the fact that what he already knows can be regarded as being continuously tested against his everyday experience of man-made environment.

Let us for a moment consider a typical working-class housing estate and children who are brought up there. Apart from possible hereditary factors their understanding of society as well as their understanding of themselves and their position in it, will develop through a variety of channels. From what has been discussed in the first part of the study, it may be concluded that the appearance of the estate is not accidental but it is more likely that several social relations, which were involved in its production, became objectivated in the end form.

For example, it is very likely that the estate has been the outcome of a governmental project on a restricted budget which required a "fast" program in view of the government's priorities in the allocation of financial resources and so on, and that all this probably had to do with the way the government (and, probably, society as a whole) views the particular social group. It is very often that these social relations bear clear effects of the end product (Fig. 57).



FIGURE 57



Among the many channels through which these children may be expected to come to an understanding of the above social relations (that is: if they do), is through their objectivations in built form, especially when the estate is compared to other residential areas so that the dynamics of the codes of representation are taken into account. Apparently, it is highly unlikely that this will occur as an instantaneous enlightenment, a "eureka" experience of something that was unthought before. Instead, from what has been discussed so far, it seems possible that they may have developed some need to understand social relations in thier social environment and that their cognitions of their surroundings may be incorporated in their direction. If already existing mental schemata of these social relations are consistent with what is objectivated, then accomodation suggests that they are strengthened while they also become more accurate. If they are not, then perceptual input places them in doubt and it may be expected that they are modified or even altered to suit incoming evidence.

It lies beyond the scope of the present study to specify the relative importance of man's cognitive experience of man-made environment when this function is compared to man's overall understanding of the world. The nature of the issue involves the scrutiny of internal processes in relation to all channels through which this understanding is attained and this appears an exceptionally difficult field for research to be conducted.

What has been discussed so far, however, suggests that cognitive experience of man-made environment may bear signigicant

effects on man's mental world, especially when one takes into account the fuller dimensions of the potential informational content of man-made environment. In this sense, environmental cognition appears to be important enough to attract the researcher's attention. This attitude is sustained by the finding that man may have cognitive needs which relate to a body of environmental information wider in range than what is required by the activity he is engaged in. In view of the above, it seems reasonable to argue that, although often weak or misconceived, the function of man's experience of his surroundings is fairly important for his process of intellectual development and his understanding of the world.

PART THREE

THE IMPLICATIONS OF THE CONCEPT OF COGNITIVE NEEDS ON DESIGN THEORY AND PRACTICE

3.0 INTRODUCTION

As noted in the overall introduction, the present study constitutes an attempt to explore the nature of man's cognitive needs in relation to the experience of man-made environment. This exploration is to be conducted in the direction of establishing possible requirements for design. In view of this orientation, the first part of the study explored the potential informational content which is stored in man-made environment in the process of its shaping. In the second part, this content, in all its richness in social relations, was brought in relation to the development of man's mental world in view of man's cognitive needs. With some reservations over the amount of inference involved, it was concluded that cognitive experience of man-made environment may be regarded as being sustained by a generalized need to know and to understand, and, as such, it is characterized by a highly significant quality. As individual cognitions relate to the development of man's mental world, man-made environment constitutes an important domain for cognitive experience which is complementary to man's overall experience of the world. Thus, when cognitive activity is not seen as relating to specific ends deriving from purposive behaviour, the object of cognition attains a different nature and man-made environment seen as a whole may be regarded as playing an important role in people's intellectual development. The aim of the third and final part of this study is to develop the above theoretical considerations further so

that the implications they have on architecture, and, particularly, urban design, can be assessed.

As has been mentioned in 2.5, there are certain doubts as to precisely how important cognition of man-made environment may be in view of man's overall experience of the world. Because of the nature of cognitive activity, which is typically an internalized process, this relative significance can not easily be tested. What is to be noted however, is that, when it comes to design practice, the whole issue can be seen from a different viewpoint. Since the designer is, among other things, the manipulator of the way in which social relations become represented on environmental forms, the issue concerns the whole scope of his work. In this sense, the function that environmental forms perform, by being domains for cognitive experience in response to man's cognitive needs, refers to the composite need in any environmental change a designer has to deal with. For this reason, taking the above function of environmental forms into account appears to be a major issue in design practice.

The ability of many modern environments to transmit messages has been questioned by a growing number of writers like Françoise Choay who referred to their "hyposignificance" (Choay, 1969, p. 31) and Bonta who commented on their "desemantization" (Bonta, 1979, pp. 30-49). This shallowness in meaning may be particularly harmful in modern societies in which it has been argued that there is a tendency of "informativism" (de Ventos, 1980, pp. 186-190); in other words, a tendency to consume objects for what they stand for (i.e. as signs) rather than what they are. If this is

correct, then there is additional importance attached to the conclusion that environmental forms function as domains for cognitive experience.

A question which arises at this point is how do architecture and urban design relate to man's overall intellectual development when they are only a part of the entire man-made environment. Table 1.3 shows that architecture and urban design involve a limited, although still extensive, number of social relations since they relate a limited number of functions. By being part of the entire man-made environment however, they participate in operating as domains for cognitive experience. It appears that, in order to reach this generalized conclusion, one first has to take the overall production of man-made environment into account, as has been attempted in the first part of the study. After the conclusion has been reached, any individual part of man-made environment (whether this is buildings, cities in general or kitchen utensils) can be regarded as contributing to this end, even though the meanings involved in each subset are limited. In any case, even on a single environmental form a whole range of social relations may be objectivated; like, for example, its significance that led to its existence, ideologies of the "doer" or user in respect to the elements in the compositive need and so on. In short, even if environmental forms appear to contain a limited range of potential meanings, they all take part in the function of man-made environment as a domain for cognitive experience which relates to man's intellectual development.

Let us now concentrate on the more specific implications that what has been discussed bears on design theory and practice. Depending on where the attention is focused, one may arrive at certain conclusions at a number of levels. These can be divided in two main categories. The first category, which is basically theoretical, is the outcome of a comparative analysis of the theoretical considerations elaborated in the present study - and, especially man's cognitive needs and their implications - with those of current theories of urban design. The concluding observations following this analysis are not, in effect, implications for the design but an assessment of the similarities and discrepancies between the present approach and contemporary theories of urban design. Apart from referring directly to design practice, it is clear that such approaches must be backed up with theoretical considerations deriving from other disciplines, especially psychology, so that an examination like this can take place.

The second category of conclusions, which will be developed in the second section are to be drawn from the merging of the theoretical formulations of this study and the design practice. In this sense, this set of conclusions will be the implications of what has been discussed so far. In other words, the aim of this section would be the exploration of the particular requirements man's cognitive needs (as they have been elaborated in 2.1) may dictate to design. Evidently, it is fairly difficult to separate a theory's foundations from its point of reference and the implications it entails in regard to its scope. Such a course of action

has to be adopted for purely methodological reasons. Hence, there will inevitably be a need for references to a theory's implications while discussing their theoretical background and vice versa.

The third section deals with two important issues which relate to the conveyance of meaning. Following what has been discussed in this study, the need for clarity in the environment and the need for a balanced rate of perceptual input are considered. In this sense, the discussion on these two issues attempts to examine the implications of the mechanics of cognitive experience in view of man's cognitive needs, with reference to these particular aspects of the conveyance of meaning.

Finally, the last section attempts to reassess the role of the designer in view of the significance that cognitive experience may have in the development of man's mental world. The conception of a broader role is inevitably paired with an increasing responsibility. Since a deeper understanding of the functions of perception in relation to man's cognitive needs is required, this appears to be a task that designers' education has to fulfil.

3.1 THE THEORETICAL CONSIDERATIONS OF THIS STUDY IN RELATION TO THOSE OF RELEVANT URBAN DESIGN THEORIES

The theoretical consideration that man-made environment is an important domain from which man attains his experience of the world has been based on three main points. Firstly, man-made environment can possibly be remarkably rich in its potential informational content. This conclusion is reached

after differentiation in form has been explained by means of social relations which affect its shaping. Secondly, man's cognition of this content relates to his process of intellectual development. When perceived, information in man-made environment is integrated in man's mental world through assimilation and accomodation. Thirdly, this function of cognition, which is difficult to be empirically tested, is sustained by man's cognitive needs. When the need to know and to understand is regarded as relating to basic human needs rather than man's goal-oriented behaviour, the scope of cognitive experience is widened. The experience of man-made environment may, then, refer to its entire potential informational content in its fuller dimensions.

Apart from leading to the above suggestion, these three points inevitably specify the context in which it is seen. In this sense, the fact that man-made environment functions as a domain for cognitive experience is of little value if one disregards the richness of potential information it contains, and the significance that this information may have when brought in relation to the development of man's mental world and in view of man's cognitive needs.

3.1.1 An Overview of the Relevant Theories

As mentioned in 1.1.2, the functionalist tradition in design disregarded this function of man-made environment. The early masters of the Modern Movement believed that architectural forms are to be approached as "working tools, or instruments" whose aim is to satisfy the needs that demanded their creation (le Corbusier, 1947). In revolting against indiscriminate

ornamentation, they preached that good forms are those which are derived from the "true nature" of the object of concern. In this sense, they paid particular attention to the operational needs of the composite need for change. Both because of the relative objectivity involved in identifying such needs and the functionalists' bias towards economy, the principles of the Modern Movement proved to be remarkably influential as regards the architectural and design production of our times.

In recent years there has been a re-examination of the functionalist tradition. Gandelsonas and Morton identify two opposing tendencies. The first is a continuation of functionalism which has now escalated into linking architecture to computer technology and to sophisticated mathematical models. The second is "an emerging tendency to view architecture as a system of cultural meaning" (Gandelsonas and Morton, 1980, p. 243). According to the latter tendency, buildings and other design projects tend to be seen as functioning at various levels rather than as merely satisfying the users' operational needs (Norberg-Schulz, 1963, p. 109 f; Hillier et al, 1972). A growing number of writers (like for instance, Colquhoun, 1969, and Broadbent, 1980a) have argued that there is more in architecture than what the functionalist principles prescribe and a notable body of research is currently being conducted on the issue.

As the present study focuses on cognitive experience of man-made environment, which may occur independently of man's purposive behaviour, it is placed within the realm of the

second of the afore-mentioned tendencies. The aim of this section, then, is to examine how this study relates to theories and views which belong to the same tendency and are similar in scope and orientation. This examination is to be conducted in view of the key formulations stated in the beginning of this section.

The question of meaning in man-made environment is theoretically covered by semiology; especially its branch pertinent to architecture and urban design. Although semiology was originally founded as a broad discipline whose object of study would be "the study of signs at the heart of social life" (Levi-Strauss, 1978, p. 9), the discussion with respect to the signs in the built environment appears to be focusing on certain issues of the field of study in particular. As noted in 1.0, such semiological approaches mainly relate to semantics and syntactics whereas the issues of the origins and use of the signs do not attract equal attention. Thus, the discussion mainly centers on the identification of the sign in the built environment (e.g. Jencks, 1980; Scalvini, 1980), on establishing the way in which the elements in the sign are structured (Eco, 1980) and so on.

A possible explanation for this is that semiology had already developed a certain vocabulary of terms based on linguistics when it became apparent that elements in the built environment may also be regarded as forming a system of signs, i.e. as standing for something not present. It was after this realization that architectural semiology took off, a little over two decades ago. The main effort was to transplant ideas and principles, which were found applicable to spoken

language, into the study of language of the built environment. For this reason, the dynamics both of the origins and the use of the signification of man-made environment becomes a question of minor importance and the architectural sign tends to be seen as a "sign-in-itself".

With reference to the attitudes taken by semiologists as regards to the origins of the sign, one may argue that the approaches they adopt do not aim at the identification of the entire range of factors which sustain the richness of the environment's potential informational content. The emphasis often lies on the "doer" (as, in Bonta, 1979, and Krampen, 1979, pp. 62-3) and this leads to an underestimation of other channels (as, for example, the users and the composite need for change or the external factor) through which social relation may become objectivated on environmental forms. The lack of a systematic approach, which would have taken into account the dynamics of the conditions of production of man-made environment, may induce the designer into assuming that it is mainly intentional personal input that allows meaning to be represented on forms. One may argue that this is implied in Jencks's illustrations in his book "the Language of Post-Modern Architecture" (1981).

As regards the use of the sign in man-made environment, the interest in applying linguistic principles allows little consideration to be taken with reference to man's cognitive needs in view of his process of intellectual development. In an attempt to relate semiology of the urban environment to psychology, as it was originally intended by de Saussure

for the case of the overall study of signs, Krampen construes a model of the cognitive act. His approach is based on the findings of phonologists in linguistics and the mathematical principles of set theory introduced in semiology by Prieto. He, then, sees cognition as a classificatory act in which an object is known by means of its oppositions to objects in the same universe of discourse and its connections with objects in the correlated universe. As objects are classified twice, once denotatively and the second time connotatively, cognition is an act of double classification (Krampen, 1979, pp. 51-60). In relation to the present study, Krampen's process of double classification points out that cognition of an object occurs both denotatively and connotatively. It also provides a description of the way in which mental schemata are juxtaposed to environmental stimuli (see 2.2). What it does not take into account however, is that stimuli are not merely classified by means of mental schemata but they also proliferate changes in the person's cognitive structures and mental world as a whole. By ignoring the operation of the functional factors of assimilation and accommodation in cognition, Krampen's approach results in divorcing the experience of man-made environment from its relation to the development of man's mental world.

Another element in his work that leads to the same conclusion is that cognition and activity are simply taken as being interdependent (Krampen, 1979, p. 59). This statement implicitly draws the attention on the relation of cognition to man's goal-oriented behaviour. Cognition, then, tends to

language, into the study of language of the built environment. For this reason, the dynamics both of the origins and the use of the signification of man-made environment becomes a question of minor importance and the architectural sign tends to be seen as a "sign-in-itself".

With reference to the attitudes taken by semiologists as regards to the origins of the sign, one may argue that the approaches they adopt do not aim at the identification of the entire range of factors which sustain the richness of the environment's potential informational content. The emphasis often lies on the "doer" (as, in Bonta, 1979, and Krampen, 1979, pp. 62-3) and this leads to an underestimation of other channels (as, for example, the users and the composite need for change or the external factor) through which social relation may become objectivated on environmental forms. The lack of a systematic approach, which would have taken into account the dynamics of the conditions of production of man-made environment, may induce the designer into assuming that it is mainly intentional personal input that allows meaning to be represented on forms. One may argue that this is implied in Jencks's illustrations in his book "the Language of Post-Modern Architecture" (1981).

As regards the use of the sign in man-made environment, the interest in applying linguistic principles allows little consideration to be taken with reference to man's cognitive needs in view of his process of intellectual development. In an attempt to relate semiology of the urban environment to psychology, as it was originally intended by de Saussure

relates to man's cognitive needs.

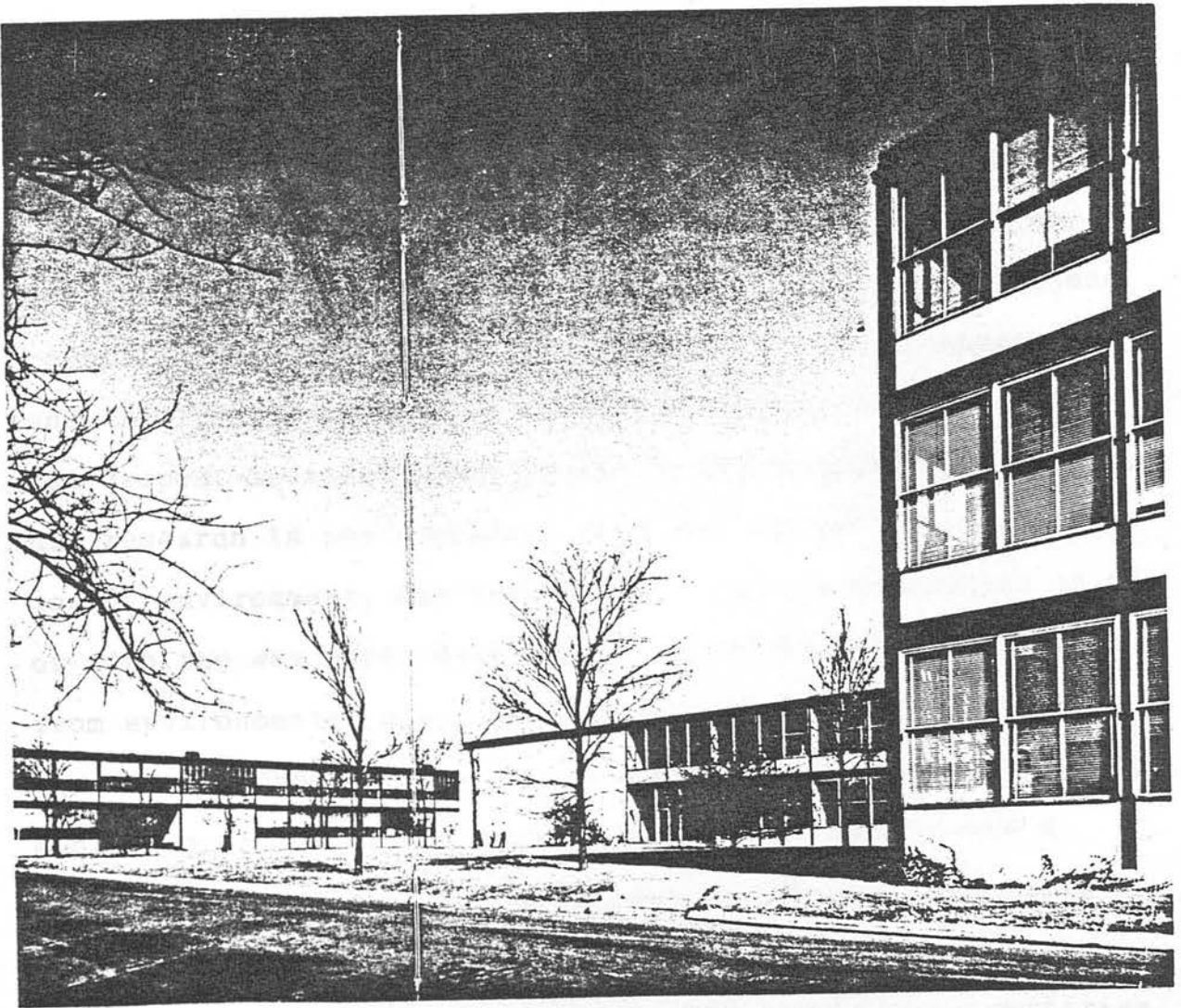
Another approach which deals with the issue of meaning in the environment is offered by Norbert-Schulz. In his work, the interest lies in linking man's holistic (both cognitive and affective) experience of the environment to his general orientation or his sense of "being-in-the-world". To achieve this, he argues that the environment should incorporate existential meanings which, as man is in search for identity, relate to his existential space, i.e. "a relatively stable system of space schemata or 'image' of the environment" (Norberg-Schulz, 1971, pp. 10-11; 1980, p. 221-3). The elements according to which existential meanings in the environment are structured are the notions of place, path and domain which correspond to analogous notions in man's existential space. The built environment forms man's architectural space which, if architecture is to function properly, should be a truthful concretization of man's existential space. "The task of the architect, therefore, is to help man to find an existential foothold by concretizing his images and dreams" (Norberg-Schulz, 1971, p. 114).

As his aim is to identify existential meanings in the environment, Norberg-Schulz does not attempt to explore the fuller dimensions of its potential informational content, nor the conditions which sustain it in the process of the shaping of man-made environment. Although in his earlier studies he refers to a wider part of this content (f.i. Norberg-Schulz 1963, pp. 118-27), he later focuses on meanings which derive

from relations such as man's relation to God or to society as a whole and so on (Fig. 58). In this sense, he is concerned with the in depth dimension of the content of man-made environment as this has been described in Table 1.3 in the present study.

It can be seen from the above that although Norberg-Schulz's work is closely related to this study, its scope is different. This is also reflected on, and accentuated by, the nature of his approach which is based on the phenomenology of Heidegger (Norberg-Schulz, 1979, 1980a, pp. 6-11). Things "out there" are regarded as entities in their own right (or, as "gathering a world") and the main interest in their perception lies in as much as experience relates to man's being-in-the-world. Since the emphasis is on the person's identity, this phenomenological approach may provide an insightful look at the role of the environment in this. The interest in the present study however, is placed on bringing the fuller dimensions of the potential informational content of man-made environment in relation to the development of his mental world, aiming at the whole range of levels at which this development may occur. Apart from being confined to cognitive experience, this orientation asks for the dissection of the content in its constituent parts in the form of representations of social relations. This need to explore the elements which sustain the richness of the potential informational content of man-made environment is incongruous with the approach adopted by Norberg-Schulz.

Furthermore, by regarding personal constructs and environmental experiences as givens, Norberg-Schulz assumes that places, like



When describing environments like Mies's Illinois-Institute of Technology, Norberg-Schulz does not refer to the whole range of social relations objectivated on the end form, but to "the image of harmonious, ordered universe" it may evoke.

FIGURE 58

Prague, Rome or Khartoum, will a priori have a "genius loci" (Norberg-Schulz, 1980a). In this sense, there is no need to explore how people's personal parameters will mix with the nature of potential information in the environment in an attempt to see which social relations are more likely to be experienced. This need was made evident in the present study, especially since some statements which may serve as cues for the designer are required to be formulated.

Summing up, Norberg-Schulz approaches the built environment as a domain for experience only that he sees this experience referring to a different human need than the cognitive needs elaborated in the present study. The need he identifies, and which asks for existential meanings, is wider than these cognitive needs (since it incorporates affective experience and involves perception in a holistic sense) and refers to the deepest meanings which relate to man's existence. Thus, his research is not concerned with the entirety of meanings in the environment, nor with the way these are embodied in it or with the way particular social relations may be inferred from environmental cues. In a similar sense, the interest in the environment's contribution to the development of man's mental world lies in as much as the conceptions of man's existence in relation to the essence of the external reality are concerned. It appears reasonable to suggest that Norberg-Schulz's approach aims at discovering these qualities of the built environment which may offer man possibilities for "peak experiences", to use Maslow's term.

A third approach to the issue of meaning in the environment is that of Peter Smith. A point of contrast between Smith's approach and Norberg-Schulz's is that they both actually aim at identifying requirements for architecture and urban design which stem from human needs other than those immediately deriving from man's operational needs. In this sense, the scope of these approaches relates to the present one in as much as these human needs refer to the cognitive needs elaborated in this study.

As regards man's cognitive needs, Smith refers to "the need to make sense out of one's environment" as well as "the need to keep mental schemata alert" (Smith, 1974). The scope of his work, however, is different than the scope of the present study, since he is basically interested in the aesthetic experience of the urban environment. For this, he applies Cannon's principle of homeostasis, as a human tendency for physiological equilibrium, for the case of man's psychological composition and concludes that man prefers a living condition in which homeostasis and tension will alternate. He, then goes into an extensive examination of the qualities of the unconscious part of the brain and notes its preferences in terms of aesthetic experience.

Peter Smith finds little interest in the content of people's purely cognitive experience of urban environments. Yet, as he is aiming at exploring the context in which aesthetic experience occurs, he focuses on connotational aspects of the environments he describes. Because of his particular orientation, in which the needs relating to the functions of the "primitive" brain are critical, he basically concentrates on meanings which correspond to archetypal images. These meanings, which may be stored in the environment in the process of its shaping, are often projected on it by people who are experiencing it. Smith characteristically writes that "by its organization of style, space, light, constriction, gloom, order and apparent chaos, [the urban system] represents a projection of the human situation" (Smith, 1974, p. 114). The emphasis is not put on the

social relations which create this situation, as this is done in the present study, but on a parallelism to the apparent dispositional elements of human nature that it may reflect in people's minds.

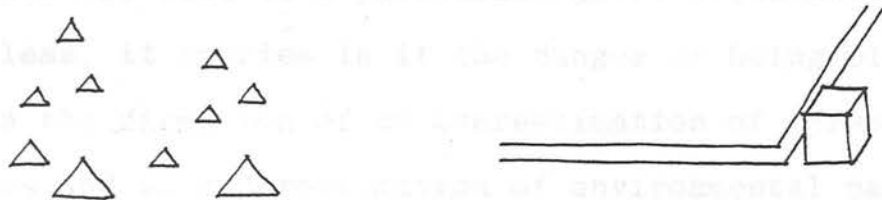
Another interesting approach which relates to the present study and which proved to be remarkably influential is Kevin Lynch's research on "the Image of the City". Since, by focusing on imageability, Lynch's work is pertinent to the issue of clarity in man-made environment, it will be discussed extensively at a later stage of this part of the study (see 3.3.1). In the present context however, the interest lies in comparing the theoretical considerations which characterize Lynch's approach (and a notable number of subsequent studies based on his writings) to those of the approach adopted in this study.

Lynch's point of departure is man's need for orientation in the complex modern cities (Lynch, 1960, pp. 1-6). Although this need clearly involves cognitive activity, the way Lynch puts it, it bears little connection to the cognitive needs discussed in the present study. There are two reasons for this. Firstly, although it has been argued that the elements which Lynch identifies in the urban environment are of existentialist nature (Pocock and Hudson, 1978, p. 49), he basically regards the activity of orientation as way-finding in view of man's purposive behaviour. In this sense, the need of orientation is viewed as an operational need and this limits its scope (see also 3.3.1).

The second reason is related to the first. In his study of the requirements set by the need for better orientation in the urban environment, Lynch is mainly concerned with the arrangement and interrelationships between the physical features in the city. By deciding to disregard meaning in the environment (Lynch, 1969, pp. 8-9), he takes little interest in examining how social relations, which are either objectivated in the environment in the process of its shaping or invested in it as it is being "used", affect the process of orientation in the city (Fig. 59). A similar attitude characterizes Lynch's study on "A Theory of Urban Form", in which he tends to divorce form from content (Lynch and Rodwin, 1970), and later research on the image of cities, where, researchers based on Lynch's methods, put the emphasis on the identification of those environmental features which are "known" by the widest number of subjects (f.i. Francescato and Mebane, 1973). In this sense, environmental cognition tends to be viewed as cognition (or, knowledge) of the form of man-made environment rather than cognition of social relations "through" their representations on the features of the form.

In response to Lynch's theory for imageability in the urban environment as a major requirement for the need for orientation, several studies (e.g. Gulick, 1963) have suggested that both visual form and social significance are important in the formation of urban images. Steinitz (1968) stressed the significance of congruence between form and activity in this, whereas Zannaras (1976) pointed at the role played by

the cognition of city structure (f.i. land use, variations in density etc.) as providing clues for way finding. As noted above, the need for orientation is given, a very different existentialist dimension - and in this sense it can no longer be regarded as an operational need - in the work of Norberg-Schulz.



Lynch's drawings underline the nature of his approach.

FIGURE 59

To conclude the overview of approaches to design which are relevant to the present study, one must consider the notable body of research presented by Rapoport, mainly in his book "Human Aspects of Urban Form" (1977). Based on a remarkable body of both theoretical and field work from most disciplines relating to urban design, Rapoport pays particular attention on the role of cognition in the man-made environment relation. He sees the environment as the organization of time, meaning, communication and space (Rapoport, 1976, p. 223; 1977, pp. 10-11). In this, cognition is important both in designing and in perceiving man-made environment.

As noted in the second part of the present study although Rapoport includes first level identification in the perceptual rather than the cognitive stage of environmental experience, he stressed the subjective element in cognition by viewing it as a process of "ordering and giving meaning" rather than knowing the environment (Rapoport, 1976, p. 233; 1977, p. 108). This formulation is basically the product of research conducted in anthropology where individual differences may become notably diverging when seen in a cross-cultural perspective, and is not intended to lead to a phenomenological orientation. Nevertheless, it carries in it the danger of being misinterpreted in the direction of an overestimation of personal parameters and an underestimation of environmental parameters and stimulus dependency in perception. As has been elaborated in 2.4, there may be certain social relations represented in the environment which may be most probably experienced than others, and this can be applicable to all three levels of potential information stored in the environment.

Furthermore, one could perhaps argue that if the above point of departure is not backed up with an approach which would put the emphasis on the individual, these meanings attached to the environment would appear to be fragmented or leading to cues for isolated behavioural responses. In a sense, it appears that Rapoport is doing precisely this - his interpretation of course is in direct relation to his interest in how people behave in different settings. Thus, although he acknowledges the fact that built environment is "a major form of cultural information" (Rapoport, 1977, p. 326), he sees

its function as a domain for experience as relating to particular messages rather than as being of a different quality, i.e. complementary to man's overall experience of the world.

One reason for this is probably that Rapoport does not look at the overall production of all kinds of man-made environment but only at urban design, in other words a part of the entire domain. As noted earlier, the examination of a partial production of man-made environment alone can not lead to the conclusions which can be drawn from a spherical viewpoint, whereas the function, that the overall conclusions help to identify, may be applicable to the parts.

The second reason is that Rapoport appears to be particularly reluctant to come to an "overgeneralization about human needs" (Rapoport, 1977, p. 383) and prefers to concentrate on specific aspects of design. In this sense, he does not attempt to unify man's cognitive experience of his environment by linking it to man's intellectual development in view of a generalized need to know and to understand. One could argue that his work, and especially the afore-mentioned book, is characterized by the lack of a clear conception as regards these needs. Such a conception would have served as a backbone to the, otherwise fragmented, collection of case studies incorporated in the book.

3.1.2 A Comparative Analysis of the Theoretical Considerations

It is evident that the issue of meaning in the environment is becoming increasingly central. Yet, as it can be deduced from the discussion in the second part of this study, meaning

can be found in various different forms, as the term acquires a series of interpretations (see also Jencks, 1969). Since environmental experience is both purely cognitive as well as affective-evaluative in character, meaning can be regarded as being an amalgam of the two. Approaches like Smith's and Norberg-Schulz's aim at the identification of requirements relating to both stages of environmental experience. The scope of the present study is different from that of these approaches because the interest lies in exploring the dynamics of purely cognitive experience.

Another observation that can be made as regards the theories discussed is that meaning would not have been dealt with by any writer if there had not been some conception of a human need it corresponds to. In all theories, except perhaps for writings in semiology, cognition refers to certain cognitive needs whether these are specific or more generalized. It has already been mentioned that Smith's and Norberg-Schulz's formulations may be taken as relating to a cognitive need that goes beyond the particular activity a person is engaged in at the time.

Cognition of social relations in man-made environment, however, does not tend to be seen as being linked to the development of man's mental world, as this has been elaborated in the present study. There are several reasons to explain why this important dimension of cognitive experience has not attracted a fair amount of attention.

The first reason is that research tends to concentrate on the requirements set by the particular activities contained in space rather than on people's basic needs. This attitude,

which basically stems from the behaviourist tradition in which people are regarded as organisms responding to external stimuli rather than persons in their own right, is partly responsible for sustaining the functionalist bias dominant in modern architecture. Cognition is seen as being operational in nature.

As noted above, this attitude characterizes a significant body of contemporary research in man-made environment relationships. Even though the rise of cognitive psychology in the last couple of decades has broadened the scope of cognition, architectural theory tends to regard the formation of mental maps as explaining or providing areas for purposive behaviour rather than relating to the development of the person's mental world. Depending on the particular kind of behaviour examined (e.g. way-finding, action resulting from evaluation and so on), cognition is inevitably seen as relating to a specific body of social relations in man-made environment rather than to the whole range of its potential informational content.

The second reason which appears to have diverted theorists attention from relating cognition of man-made environment to the development of man's mental world has to do with the nature of environmental experience. When cognition is regarded in momentary terms, it tends to appear fragmented and, possibly, accidental. Even when one perceives a certain social relation objectivated in man-made environment and this seems novel to him, the dynamics of environmental experience are not fully considered. This may only happen

if the impact of cognition is approached in its long-term effects. Cognition of social relations in man-made environment can, then, be seen as relating to something stable, although evolving, namely: man's cognitive structures. As noted above, Piaget's principles of assimilation and accommodation of experience provide an explanation of how individual cognitions are integrated in man's cognitive structures and mental world. This function can be regarded as taking place both in relation to specific cognitive structures and to the person's entire mental world.

The last reason to explain why the relation between environmental cognition and the development of the person's mental world has been underestimated is that most writers tend to overestimate perception of form and first level identification of objects. This attitude, which has already been mentioned for the case of Lynch's theory, has a direct implication on the nature of mental schemata which are regarded as being relevant to the experience of man-made environment: schemata are seen as being essentially directional and shape-like formations.

Peter Smith suggests that "to a child a house is as pictured here (Fig. 60). This is the basic house schema. As experience develops, the schema is extended into sub-categories such as terraced house, semi-detached etc. Ultimately, it crosses time and space to embrace historical and modern houses at home and abroad. The extent of the sub-division is a matter of experience and, to some degree, conscious learning (Smith, 1974, p. 27).

If one takes into account what has been elaborated in the second part of the present study then what Smith is in effect describing is the image of the elevation of a house when one faces it from the street. As experience develops

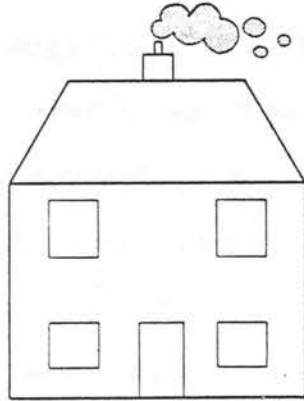


FIGURE 60

one may extend the schema of the elevation to include different house typologies.

It can be argued that this conception of a schema corresponds to the schema of the form of a house, or the spatial aspect of the schema of the concept "house". From what has been discussed so far it may be expected that, through this schema, one may experience several social relations which have been objectivated on man-made environment as differentiations in form (e.g. characteristics of the users, the designer, the social framework, discrimination of rooms and functions within the house and so on). The mere existence of the house signifies that there are (or were) people who live in this place, and hence, it may be experienced in this manner.

When the emphasis is placed on the spatial aspects of mental schemata, it becomes difficult to penetrate satisfactorily beyond the visual aspects of a form. Cognition, then, will tend to be seen as referring to first level identification of objects, the richness of the potential informational content of man-made environment tends to shrink and the relation between cognition and the person's mental world becomes distant. For this reason, the term "schema" ought to retain its other, basic meaning from the Greek, and that is "model", "an abstract internalized model of an external reality". In this sense, whatever notion one has in mind about something "out there" is by definition a schema. As the interest in the present study lies in the exploration of the requirements set by man's cognitive needs, it is important that the impact of experience on the conceptual (and not only the spatial) aspects of mental-schemata are thoroughly considered*.

The tendency to overestimate perception of form can be found in many writings in the literature. Historians have been criticized as merely describing the formative aspects of buildings rather than relating their form to its content and conditions of production. Even Norberg-Schulz, who is

* It must also be noted that the schema in the figure above is not the only one depicting the spatial aspects of the concept "house". Such a concept is complex enough to constitute a cognitive structure and, hence, comprise an extended array of hierarchical schemata. Some of these may be so widely shared as to be strong signifiers of the whole structure (e.g. the smell of pipe-smoking next to the fireplace or that of boiled vegetables coming from the kitchen).

particularly interested in identifying existential meanings, often appears to be concentrating on the spatial aspects of schemata (e.g. Norberg-Schulz, 1971, pp. 10-11). A similar attitude has also tended to characterize many semi-ologists who, following the properties of spoken language, have searched into the elements of the form of buildings (f.i. brick, column, etc.) in order to identify the "semantic unit" in architecture. It appears reasonable to suggest that, if such a unit is to be found, it is more likely to exist at the level of content, whether in the form of a social relation or else. Naturally, even if there is stimulus dependency in perception, this unit of meaning is subject to the individual's personal parameters. By focusing on man's cognitive needs, this study has been concerned with the experience of the environment's potential informational content and the significance that this function has for man. In summation of what has been discussed in this section, it is to be noted that the above Urban Design theories, although related to the present study, are not identical in scope since they do not center on these issues.

Norberg-Schulz's approach, for example, which focuses on man in his own right, does not confine itself to his cognitive needs. Moreover, the phenomenological orientation that the writer adopts does not permit a comprehensive analysis of the fuller dimensions of the environment's potential informational content to be conducted. On the other hand,

many approaches, which tend to regard cognition as referring to some foreseeable action, clearly entail the danger of confining themselves to the identification of a limited portion of this content as well as of underestimating the significance of its cognition

3.2 THE DESIGNER AND MAN'S COGNITIVE NEEDS

3.2.1 Cognitive Needs and the Composite Need for Change

Man-made environment embodies a rich variety of representations of social relations some of which become objectivated on it in the process of its shaping, while others are invested in it after it has been produced. From what has been discussed so far it follows that there are two ways of looking at how this environment is experienced; at least, in as much as cognitive experience is concerned. The focus may either be on the activity, or activities, performed in the particular environment, or on the individuals who find themselves in it.

In the first case, cognition is operational in nature. Information that needs to be perceived, is to some degree dictated by the activity itself. Although a relatively extensive body of information is expected to be involved, this is bound to have certain limits since cognitive experience relates to distinct ends.

When the focus is placed on the individual seen in his own right, there are several needs that he may have developed regardless of the particular activity he is engaged in. In as much as his knowledge and understanding of his environment

is concerned, there is a cognitive need which may either exist in an independent form, as some psychologists claim, or may be directly stemming from other basic human needs (see 2.1). This cognitive need, which is liable to the condition of personal parameters at the time of perception, can be taken as bringing all what is perceived in relation to the person's mental world and as having the tendency to cover the whole range of social relations represented on man-made environment in all its richness.

According to the analysis of the composite need for change, which leads to the production of environmental forms, "by-needs" fluctuate between two poles as they either tend to be operational to the activities required or they may relate directly to man's basic needs, and hence, transcend the scope of the particular activity (see 1.1.2). The discussion in this study suggests that man's cognitive needs appear to be following a similar pattern.

The immediate implication, which derives from this, concerns the designer. In his search for the requirements posed to him by the situation in hand, the "doer" must adopt two approaches to the issue of the users' cognitive experience of the forms he designs. As noted above, the difference between the two approaches lies on where the emphasis is placed.

In activity-oriented approaches, an extensive but limited amount of information is involved. The discussion in 2.2.4 pointed out that, although all features of the end product may have to be considered, this is typically in so far as

meanings which sustain or facilitate the particular activity are concerned. The users' personal parameters are naturally to be taken into account, yet these do not relate directly to cognitive activity. The properties and requirements of the particular activity contained in space serve as a stepping stone in this relation between cognitive processes and what is experienced.

The approach in which the emphasis is placed on the user is essentially different. The user's needs as a person are considered; in this case, his cognitive needs. The role of the image of environmental forms in gratifying these needs points at the fact that cognitive activity may refer to any part of the environment's potential informational content. This, as well as other aspects of such cognitive activity, depend on the individual's personal parameters both in their trait and the state-like characteristics. What is therefore required is a deeper understanding of the user's personal parameters. This is paired by the awareness that, as people may theoretically experience any social relation embodied in the particular environmental form, the whole range of its potential informational content is liable to take part in this process.

The importance of the above lies in that it distinguishes two functions in which environmental forms are involved in as much as man's cognitive experience of them is concerned. Firstly, cognition of a certain body of information in them is necessary to sustain or facilitate the activity in hand and secondly, experiencing social relations through their

representations on them is important for the development of man's mental world in view of his deeper cognitive needs. It is clear that the distinction between cognitive experience which is dictated by man's operational needs and that which relates to his deeper cognitive needs can not always be well defined (see also p. 24). As noted in 2.2, operational cognition may refer to all features (but not necessarily potential content) of an environment while cognitive experience needed to cope with a particular task is also expected to be accommodated into man's mental world. In this sense, the two elements in the distinction may often be overlapping.

On the other hand, there may often be cases in which they are in conflict. For example, when the emphasis is placed solely on the activities contained in space and cognition is seen as being primarily operational in nature, the gratification of the deeper cognitive needs that man may have developed appears considerably hindered. Reversely, an environment which looks like an agglomeration of museum exhibits, because of the multitude of social relations objectivated on it, will possibly affect goal-oriented behaviour (see also 3.3.2). This apparently, depends the nature of the activity and it may be expected that the consideration of the user's personal parameters will provide the designer with enough clues to deal with the problem.

The above distinction becomes particularly interesting when it comes in relation to contemporary architectural practice. Partly because of the functionalist tradition and partly because of the context in which the designers'

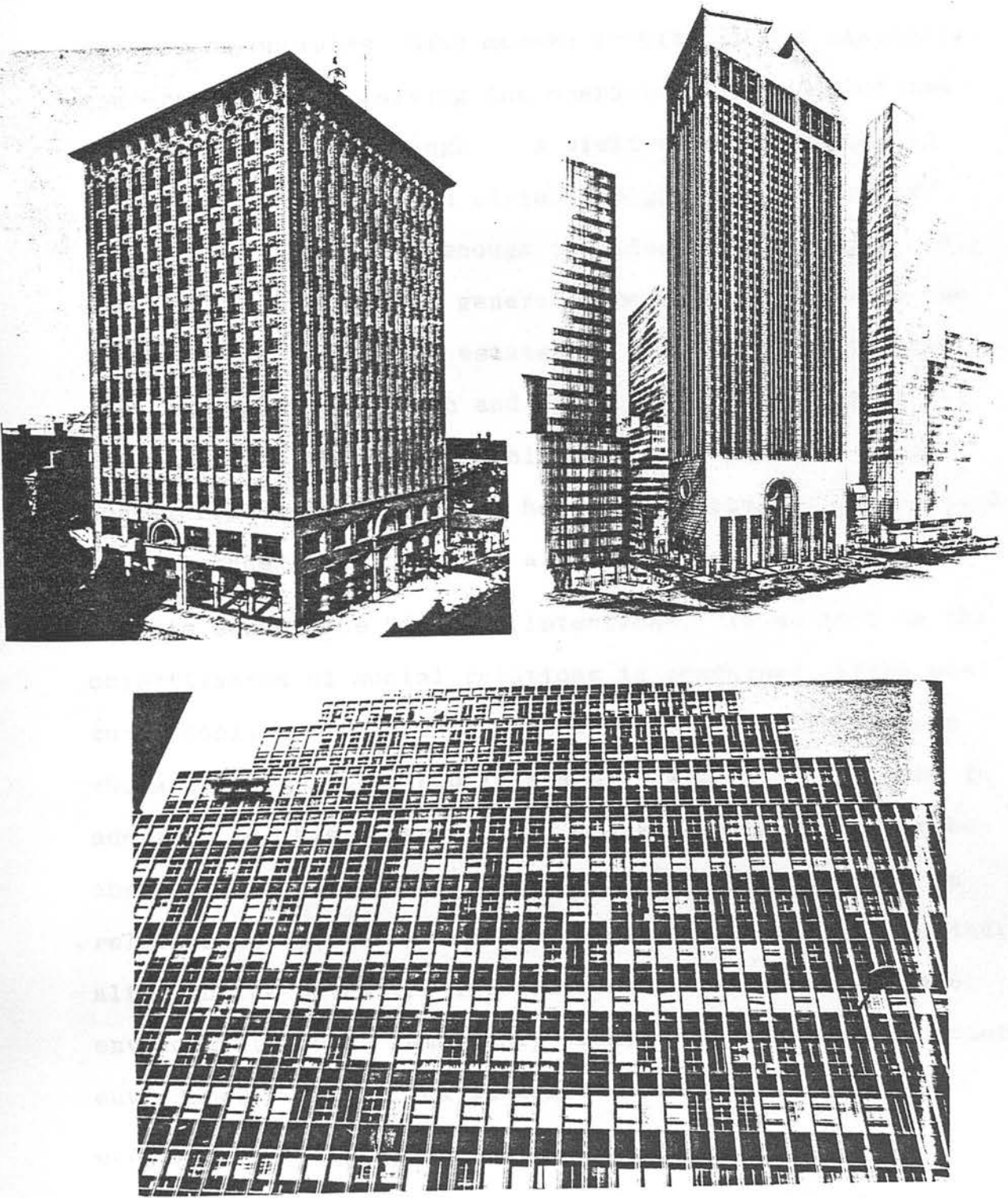


FIGURE 61 Top left: Guaranty Building, by L. Sullivan, Buffalo, 1894-95.
Top right: AT & T Building, by P. Johnson, New York City, 1978-82.

On the elevations of these two buildings, the designers attempted to objectivate a few more social relations than what is strictly necessary to sustain the functions needed. Such social relations are the relative significance of the activities on different floors, a number of cultural elements, the significance of the project itself seen as a whole and so on. A similar comment can not generally be applied for the typical anonymous down-town office block, like the one at the bottom.

profession operates, many modern architects are basically concerned with satisfying the operational aspects of the composite need for change. A visit around a number of buildings in most modern cities designed in "anonymous" international style is enough to illustrate the point (Fig. 61). The situation is generally becoming worse when one takes a look at housing estates. A door is little more than for passing thorough and so is a corridor. There is not much else there for cognition apart, perhaps, from social relations which have become objectivated by precisely this absence (see 2.5; see also Figs. 24, 57 and 62).

In this sense, the "doer's" intentions, in as much as the objectivation of social relations is concerned, often seem to be confined to what is strictly necessary to sustain the activities contained in space. What usually comes in addition to this is an overall message which may often be abstract and tangential (see Fig. 35). Finally, and in relation to what has been discussed in 3.0, it appears that although the potential informational content of man-made environment can be remarkably rich, a notable body of modern environments remain low in content.

With reference to the overall architectural and urban design production, no one can claim that designers always work along these lines of thought with little consideration over people's deeper human needs. The history of architecture, especially that of the last century, abounds in cases of individuals who were, and still are, particularly concerned about the social implications of their work. Yet,

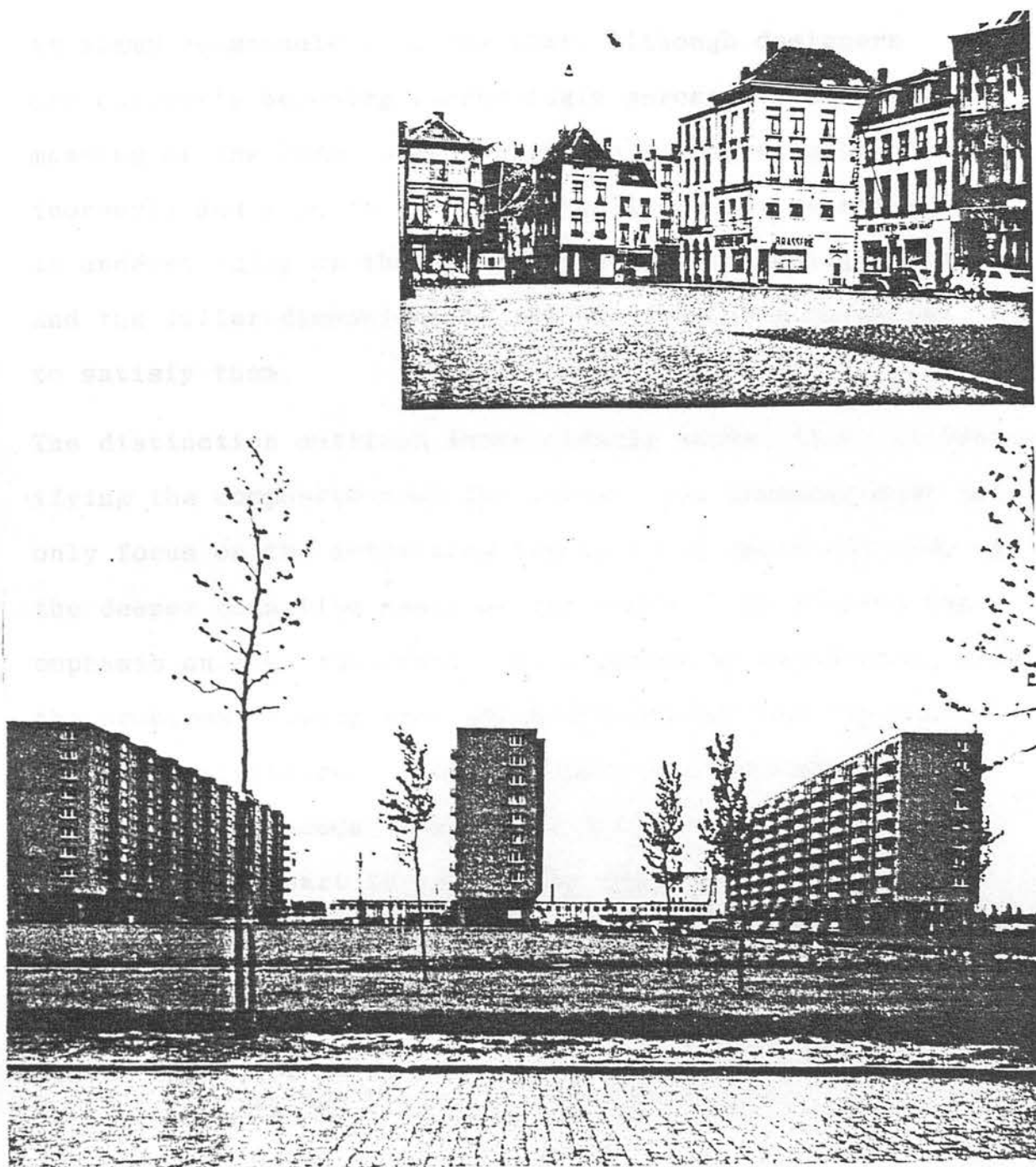


FIGURE 62

Top: A square in Antwerp
 Bottom: New housing outside Antwerp (1958)

Although the image of the square is not particularly exciting, it incorporates many connotational social relations of culture and several second level social relations of the relative significance of functions, like those of discrepancies between different houses, floors and space in the square and the nearby streets. It is not an understatement to say that the housing scheme below is sticking to what is strictly necessary for the activities involved (i.e. primarily, housing and, then, sleeping, cooking, finding the lift and so on).

it seems reasonable to argue that, although designers are currently becoming increasingly perceptive over the meaning of the forms they design, this occurs in an inderly and superficial way since it is not paired with an understanding of the nature of people's cognitive needs and the fuller dimensions of the environment's potential to satisfy them.

The distinction outlined above clearly shows that, in identifying the composite need for change, the designer must not only focus on the activities contained in space but also on the deeper cognitive needs of the users. By placing the emphasis on the individual, the approach is safeguarded from the problems arising from the misconceptions of the functionalist principles. The realization of the existence of such cognitive needs, and of the fact that environmental forms may take part in gratifying them, appears to be the first step in dealing with the low potential informational content of man-made environment.

3.2.2 Cognitive Needs and Social Relations Involved in the Production of Environment

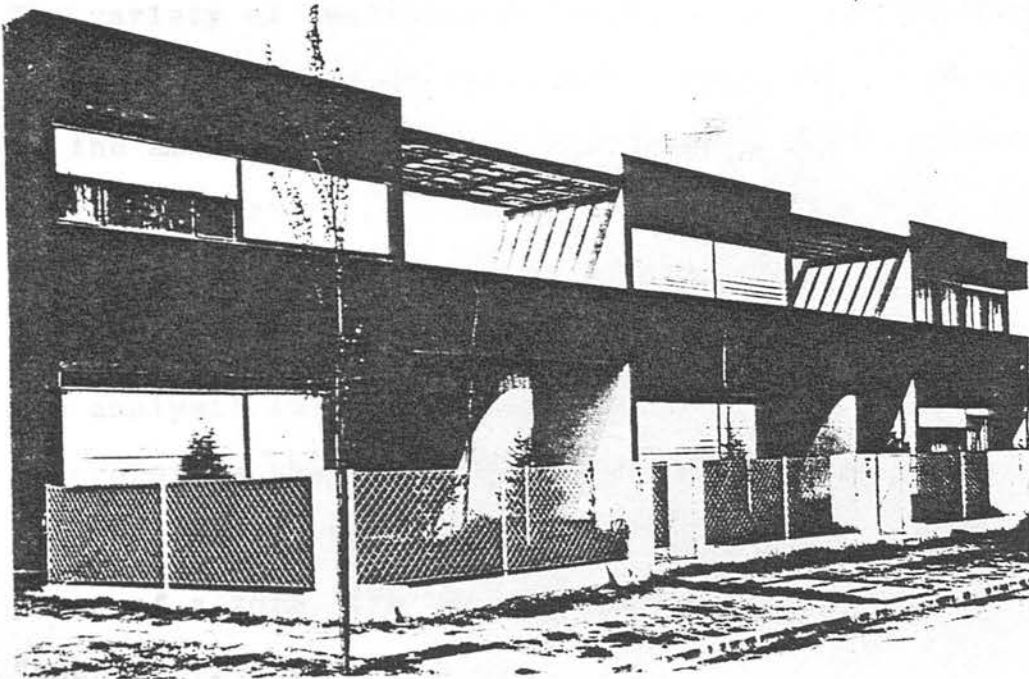
The question which arises at this point is where is meaning to be found; is it simply to be added on whatever the final solution is and, if it is so, how far can this go. To answer the question let us take a look at the dynamics of the potential informational content of man-made environment as it has been analyzed in this study.

Out of all social relations which are somehow involved in the production of environment, only a part becomes represented

on the end product. The approach in 1.2 and table 1.3 suggest that there may be many social relations which could have been objectivated as differentiation in form. These social relations will tend to be excluded from the end product by the designer who does not see cognitive needs which are not operational in character as being a constituent part of the composite need for change.

In this sense the potential content exists and it comprises all social relations which, however distant, are somehow involved in the production of environment. To acquire a clear picture of this potential content, table 1.3 must be approached in relation to the three families of channels through which social relations may become represented on man-made environment: the internal and external factor and the composite need for change. Since most of these social relations (apart, in a sense, from the designer's particular personal intentions) are part of and, in fact, set up the problematic situation, it is erroneous to see them as being extrinsic to it. For this reason, objectivating them is not a matter of filling-in the final solution with alien elements but concretizing what already exists in an abstract sense (Fig. 63).

Naturally not all social relations from table 1.3 are eligible to become represented on concrete form. Some of them, like for example the significance of eating for man, may only result in the existence of a kitchen or a dining area. When this becomes more specific, however - e.g., by being regarded in relation to other functions of the house,



Pessac Housing, by le Corbusier (1925).

It is interesting to note how the original scheme (above) was transformed by the occupants. Ground floors were walled up, pitched roofs were added, the ribbon windows were divided up and a great number of signs of "security", "identity", "ownership", were placed all over the exterior. The pure and abstract Corbusian lines were destroyed by the users' need to "see" more in their homes.

FIGURE 63

a particular social framework and so on - it leads to distinct differentiation in shape, dimensions, colour and other physical features of the end product.

In this sense, starting from each function included in the final design, the "doer", must consider both the significance of the need it corresponds to, seen in various contexts, and the ideologies involved as regards the users, the broader context, his own intentions and orientation and so on.

The variety of functions contained in a single average project (ranging from the overall function, or functions, to the smallest window or pedestrian walkway) ensures an analogous variety of identified social relations, most of which can be objectivated in concrete form through a number of existing codes. As it can be seen from the above and the analysis in 1.2, these codes are remarkably varying in nature since they correspond to a wide range of social relations. In this sense, they refer to the structural parts of a form, its basic dimensions and features, its "non-functional" parts and so on.

As architecture and urban design are low in criticality when compared with the design of technical objects (Rapoport, 1974, p. 87-89; see also 1.1.4), the end product can incorporate a considerable amount of "non-functional" differentiation in form. It has to be noted though that this differentiation can only be regarded as non-functional in as much as the particular activity performed in space is concerned. According to the discussion in the second part of this study, it is expected to function in relation to

man's cognitive needs and the development of his mental world and this is precisely why it is required.

As noted in the preceeding section, a growing number of theorists have commented on the need for the environment to embody meaning in one form or the other. On the particular issue of where this meaning is to be found, attention has often been attracted by the activities performed in space. As early as 1962, Aldo Van Eyck said that "[architecture] should be conceived as a configuration of intermediary places clearly defined ... [this implies] breakaway from the contemporary concept of space continuity and the tendency to erase every articulation between spaces, i.e. between outside and inside, between one space and another (between one reality and another)" (van Eyck, 1962). Similar attitudes have been expressed by other writers such as Norberg-Schulz who pointed out that the form should have structural similarities with the building task (Norberg-Schulz, 1963, p. 179).

As the interest in the present study lies in examining the requirements set by man's cognitive needs, the analysis of the dynamics of the factors which sustain the richness of the environment's potential informational content is of singular importance. For this reason, the discussion in the first part of the study is particularly useful in identifying the social relations involved in the production of environment and the way they may become represented on the end product. It appears that, not only the functions and the overall symbolism of the form, but also another body

of social relations which are sustained by the external and internal factors may be eligible of objectivation.

3.2.3 Personal Parameters and the Representation of Social Relations on Environmental Forms

From what has just been discussed, it follows that the designer finds himself amidst an extensive body of social relations which are linked with the situation in hand. As noted in 1.2.4, by his position as the "doer", he constitutes the "bottleneck" through which these social relations pass so as to result in concrete differentiations in form. Some of these social relations he can not do else but allow to become represented on the end product, others he furnishes with personal elements either by choosing over them or by interpreting them in his personal manner and, finally, a third body may derive from his position as regards the problematic situation as well as from his past experience and overall motivation in life. The "doer's" awareness over the social relations he objectivates varies and it may be expected that for the average designer it ranges from intentional to unconscious.

In view of the low content, of many modern environments and people's "effort after meaning" (to use Bartlett's phrase), it appears that an increased signification requires an increased awareness from the designer's part over the social relations involved in the production of man-made environment. Yet, since the emphasis at this stage is to be placed on the user and his cognitive needs, this is not enough.

What is required is a deep understanding of how cognition

operates, what role do social relations play in this and how important their representations on environmental forms may be for people's intellectual development in view of their cognitive needs. Furthermore, as personal parameters have been proved to be of curcial importance in perception, the understanding of the particular context in which cognitive experience is to take place is critical: which codes are known to people, what do they associate them with, what are their aspirations in life, what do they expect to come across in a particular environment and so on.

In other words, the designer has to be fully aware of his position as a channel through which social relations are represented in the forms he designs, and, as such, as a manipulator of meaning. The understanding of the function and significance of cognitive experience for man is required so that the designer is not engaged in producing eccentric, arbitrary or meaningless solutions. As Hersberger puts it, in a rather strict manner, "the architect must obtain reliable and valid information about the relationships between the formal properties and attributes of what he designs and the thoughts, feelings, attitudes and behaviours they tend to evoke... The architect, to design new environments which will maximally benefit the occupants, must know which aspects or attributes of the physical environment cause which thoughts, feelings, attitudes and behaviours as a minimum. He should also know why, if he has any desire to predict beyond the sample of population he has studied" (Herschberger, 1972, his emphasis).

A study of the users' personal parameters is important since people differ in the way they perceive their environments. Among various methods aiming at the identification of discrepancies in this, is the repertory grid based on Kelly's personal construct theory (see Harrison and Sarre, 1976). Yet, a complete mastering of people's personal parameters which would give precise clues about their cognitive needs at all times and the way the environment will be experienced is obviously unattainable. In fact, this is the reason why a deep understanding of the function of objects in relation to man's cognitive needs is needed as opposed to blueprints which are to be applied to any circumstances in a manner similar to Alexander's earlier activity matrices. This understanding appears to be needed at the stage of "pre-structuring" of design problems (Hillier et al, 1972). Since it requires a significant body of specialized knowledge, it appears necessary for it to be incorporated in the designers' educational programs. Even if a precise identification of people's cognitive needs is unattainable, the discussion in the second part of this study has shown that there are a number of conclusions at which one can arrive as regards their function. The fact that the whole range of the environment's potential informational content may take part in cognition is one of them.

Furthermore, although personal parameters among different individuals are typically in discrepancy when seen in their entirety, they also include a number of similarities (see 2.4).

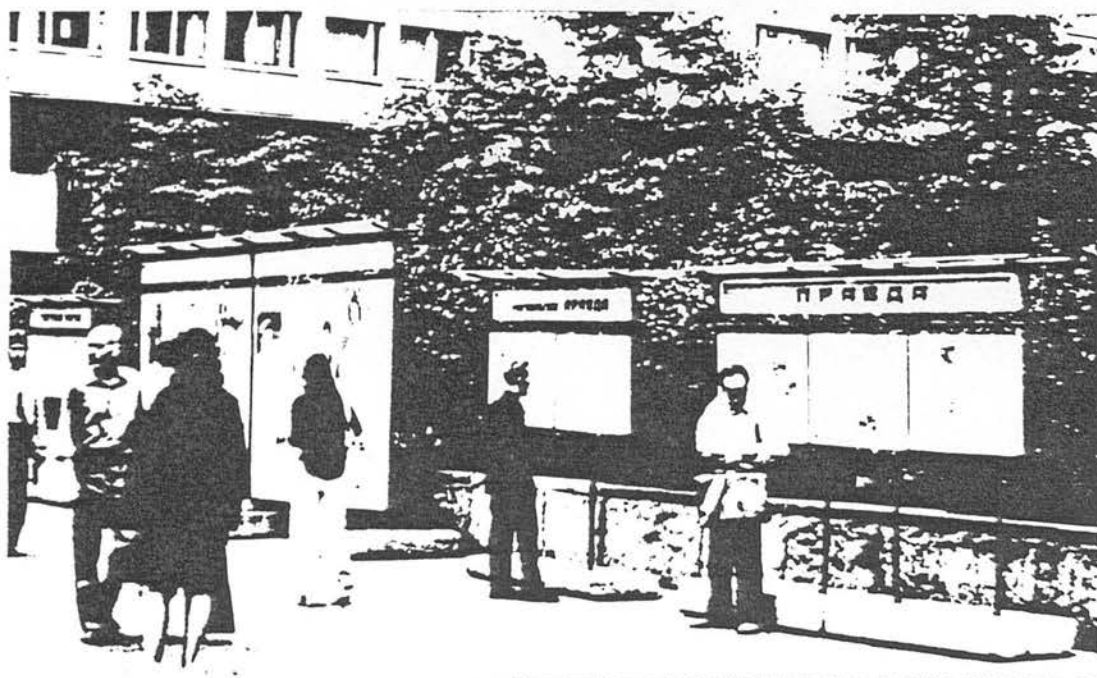
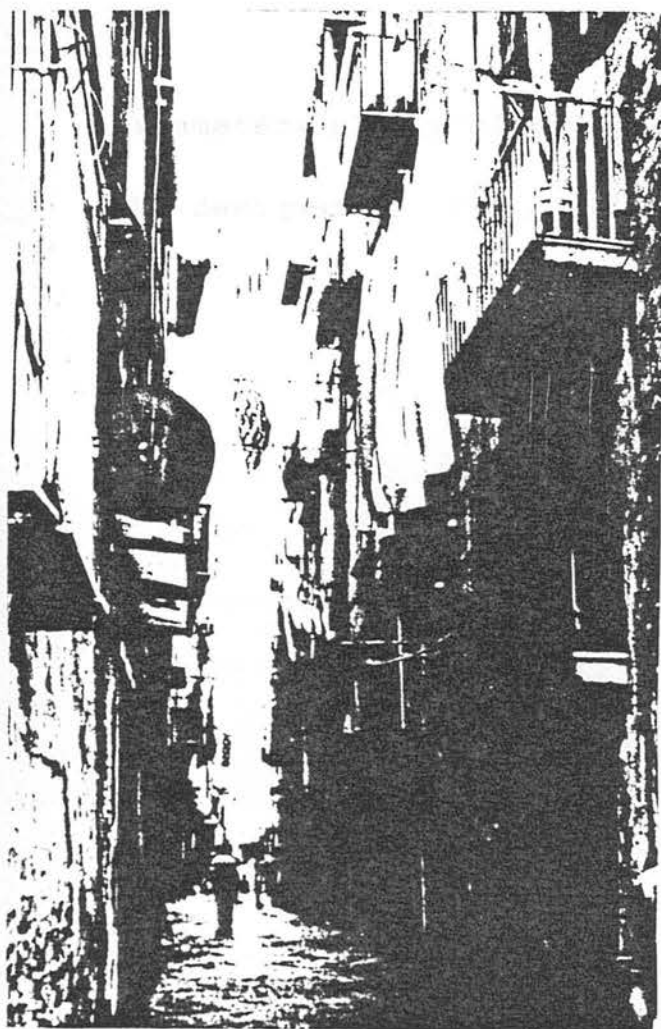
This is what enables us to come to certain generalizations. The fact that people may be characterized by a cognitive need which transcends the scope of the activity they are engaged in at a given moment in time is, in fact, such a generalization. Similar observations can be made as regards people's images of the built environment.

Following the discussion in 2.4, these images are to a degree shared as a consequence of similarities in personal parameters. Depending on the conditions in which experience takes place and in view of people's personal parameters, the designer can come to a conclusion as to which situations may ask for cognitive experience to occur in a more deterministic rather than possibilistic sense. When there is a need for the emphasis to be placed on certain social relations in space for example, a landmark may serve as a focal point to attract attention and initiate responsive perception (see Appleyard, 1973). At this point, it is important to note the role of distinct denotational meanings in reinforcing shared images in people's minds (Venturi, 1977; see also Boulding, 1956, p. 64).

There may even be something to be done as regards the idiosyncratic nature of cognitive experience. Maslow has suggested that the person who finds himself in the condition of "Being" derives vital pleasure from examining things in their own right and that this may be the basis for what he called "peak experiences" (Maslow, 1968, pp. 74-96). To approach the problem, the designer must realize that he, himself, is subjected to the limitations posed by personal

parameters in influencing cognitive experience. The issue is to be regarded at another level in which the designer must not expect to have any clues as to what the individual may experience in the environment - a high potential informational content is naturally required in this case. What the designer should aim for is to incorporate such functions and elements in his designs which will increase the possibilities for rich idiosyncratic perception to occur. It has been argued that incorporating elements of disorder may prove useful to this direction (Sennet, 1970). More specifically, open ended design, in which people take part within a given framework, as well as merely introducing people in semi-permanent activities in places like streets, may increase the environment's richness and its capacity of being stimulating (Fig. 64). As will later see, complexity and novelty also play a significant role in this.

To conclude the section on the immediate implications the recognition of man's cognitive needs as these have been laid in this study has on design, the following points can be stressed. The realization of the non-operational nature that cognitive experience of man-made environment may have placed the emphasis on the individual when the composite need for change is to be identified. This asks for the whole range of social relations, which are somehow involved in the production of a form, to be considered in view of the users' personal parameters. It is understood that the users' cognitive needs may ask for cognitive experience to refer to any social relation in the environment and then integrate its impact within the person's cognitive structures. Personal



There are a number of ways to ensure a changing environment which may generate different idiosyncratic experiences. Elements which attract on-lookers and, amongst other things, change the context in which an environment is seen (like the square in front of Beaubourg in Paris, above left, or the posted newspapers in Moscow, below) or even, allow the residents to keep expressing themselves in some manner (as in the narrow lanes of old Naples, above right), are expected to function in this direction.

FIGURE 64

parameters play a significant, if not vital role in this. The designer is required to acquire a deep understanding of the issue at several levels. Firstly, at the theoretical level of how cognitive experience operates and how the representations of social relations in man-made environment are linked with the development of man's cognitive structures. Secondly, at the analytical level of identifying the dynamics of personal parameters of people in a particular situation in relation to possibilities for cognitive experience. Finally, at a somehow practical level, the designer is required to understand his position as a channel for the objectivation of social relations in the forms he designs, and as a manipulator of potential meaning. As regards the particular context in which he operates, an awareness of the way in which meaning will be conveyed (f.i. known codes and so on in view of people's personal parameters is required.

3.3 TWO IMPORTANT ISSUES RELATING TO THE CONVEYANCE OF MEANING

Up to now, we have seen that man-made environment embodies a potential informational content of some notable dimensions which relates to man's cognitive needs and the development of his mental world. How cognitive experience actually takes place has been discussed extensively in the second part of this study and it has been found that it clearly depends on man's personal parameters.

Regardless of the characteristics of the specific users of an environmental form, there are several provisions that the designer has to take care of so that information embodied in

his designs are transmitted smoothly and efficiently. It has been noted that the human mind has certain properties, preferences as well as limitations as regards the communication of messages. It is characterized by a need for clarity, a need for a balanced perceptual rate so that environments should not be either too monotonous or too overstimulating, a need for a certain amount of novelty and surprise in the messages received and so on.

Depending on the circumstances (personal parameters may be critical in this), these tendencies may differ, but there is still some evidence to suggest that, in a generalized manner, they exist for all humans and, in this sense, affect the way meaning is conveyed.

In this section, we will consider the first two issues, namely, the need for clarity and legibility in man-made environment and the need for a balanced perceptual rate. If we take a look at the communication model in table 2.4.2, they both have to do with the elimination of noise in the system. The theoretical foundations to deal with the above issues have been laid by Kevin Lynch (1960) and by Rapoport and Kantor (1967) respectively. In the present context, these are to be reassessed in view of the theoretical considerations elaborated in this study as regards man's cognitive needs.

3.3.1 The Need for Clarity and Legibility in the Environment

Kevin Lynch's Theory in a Different Perspective

As noted in 3.1.1, Kevin Lynch, suggests that the imageability

of the built environment is essential for people's orientation in the city. In explaining what he believes that imageability has to offer in the experience of man-made environment, he states that, "[imageability is] that quality in a physical object which gives it a high probability of evoking a strong image in any given observer. A highly imageable city in this peculiar sense would seem well formed, distinct, remarkable; it would invite the eye and the ear to greater attention and participation. The sensuous grasp upon such surroundings would not merely be simplified, but also extended and deepened. Such a city would be one that could be apprehended over time as a pattern of high continuity with many distinctive parts clearly interconnected. The perceptive and familiar observer could absorb new sensuous impacts without disruption of his basic image, and each new impact would touch upon many previous elements. He would be well oriented and he would move easily. He would be highly aware of his environment". (Lynch, 1960, pp. 9-10).

In developing his argument further however, Lynch assumes that "an environmental image may be analyzed into three components: identity, structure and meaning". Following this observation, he hastes to divorce meaning from the first two components, on the grounds that there is a wide variability in the "individual meanings of a city", confusing meaning with fourth level associational experience (2.2.3 and 2.4). In doing so, he inevitably confines environmental objects as to being capable of evoking their identity and structure. In this sense and in contrast to

to what has been analyzed in the passage above, objects in the environment are looked upon as though they were devoid of any representations of social relations other than those of their own "self". The problem of imageability of cities, then, is to be dealt with by nothing but the production of such an urban environment whose form would be easily imprinted in people's minds as a roughly shared mental map. As this map would consist of merely first level identificational information, the designer's main responsibility would be to eliminate discrepancies in group images by strengthening the formative aspects of the image of objects in relation to their organization in space.

This is characteristically expressed by Lynch's laborious search for theories of orientation in primitive societies or through unfamiliar landscapes so as to apply them in the case of supposedly "meaningless" environments. Modern cities do carry meaning however, and one should never ignore the fact that this meaning may occur at various levels of cognitive experience (e.g. commercial centre, lively square or street, old district where such and such has happened, a friends neighbourhood, the part one visited on Sunday and so on). A number of studies stress the fact that such meanings play an important role in the formation of the image of cities (e.g. Gulick, 1963; Steinitz, 1968; Zannaras, 1976).

Such multi-dimensional meaning, combined with one's past experience and motivation and the way one relates to one's environment, will generally provide enough cues for one's orientation. If it does not do so and there is no city map around, one may always ask for one's way with no actual

psychological costs involved since one would presumably have been a visitor in an unfamiliar environment.

If Lynch accepted the fact that the urban environment embodies a series of representations of social relations which evoke meaning and feeling at various levels to people who experience them, then there would have been no need for him to go into various theories of spatial orientation to support his theory. To break down the image into identity and structure, on the one hand, and meaning on the other and to dismiss the latter, does not only constitute a grave methodological error (as meaning may include identity and structure), but it also makes things difficult.

As it has been previously discussed (see: expectancy, 2.2.1), the individual definitely needs to know where he is at any moment. Edward Hall states that "man's feeling about being properly oriented in space runs deep. Such knowledge is ultimately linked to survival and sanity. To be disoriented in space is to be psychotic", (Hall, 1966, p. 99). If the need for orientation is seen in its broadest sense, then it clearly relates to more basic human needs, particularly to Maslow's safety needs and the cognitive needs which have been elaborated in the second part of this study. For this reason, instead of merely asking for the identification of spatial relationships, the need for orientation must be seen as referring to the deeper awareness and understanding of the social relations which set the immediate situation a person finds himself in. In this sense, it covers an extensive body of the social relations which are represented in man-made environment.

In view of the above, it appears that man needs a legible environment and that such legibility ought not to be confined to identificational information in respect to a need for basically spatial orientation. If one considers tables 1.3 and 2.4.2, the representations of social relations which are to be objectivated in the environment must occur clearly and legibly in accordance to known vocabularies.

And, along with social relations themselves, their relative importance (e.g. primary function and ideology of primary function, or primary and secondary functions and so on) must also be clearly objectivated in a hierarchical way (Fig. 65). Then, juxtaposition against mental schemata will tend to occur smoothly and efficiently.

When seen in this context, the need for orientation is transformed to a need for "social orientation" which includes the first. It becomes a question of "clarity versus noise" in all levels of representations of social relations on environmental forms and, as such, it includes relations in space. In this respect, the core of the argument lies beyond the satisfaction of the operational need to reach certain places, as it has been implied by Kevin Lynch. Instead, it incorporates the sense of enjoyment and reassurance experienced by the individual who, by grasping the "feel of the place" easily and by letting schemata be juxtaposed to environmental input smoothly and clearly, rediscovers the social relations in his surroundings.

Clarity and Legibility in the Representation of Social Relations in Environmental Forms

One could list a long series of illustrations showing clarity

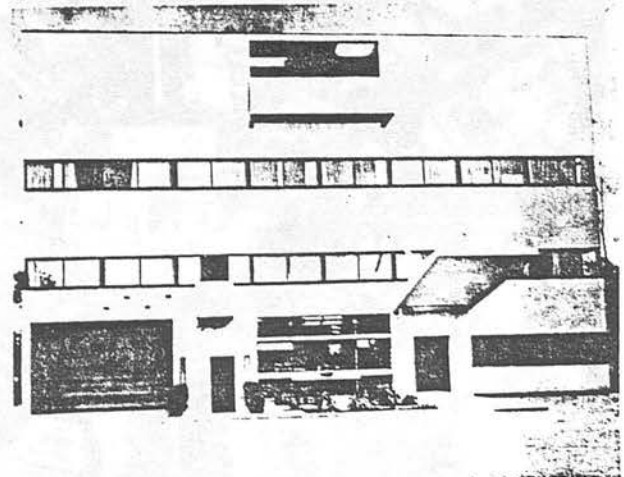
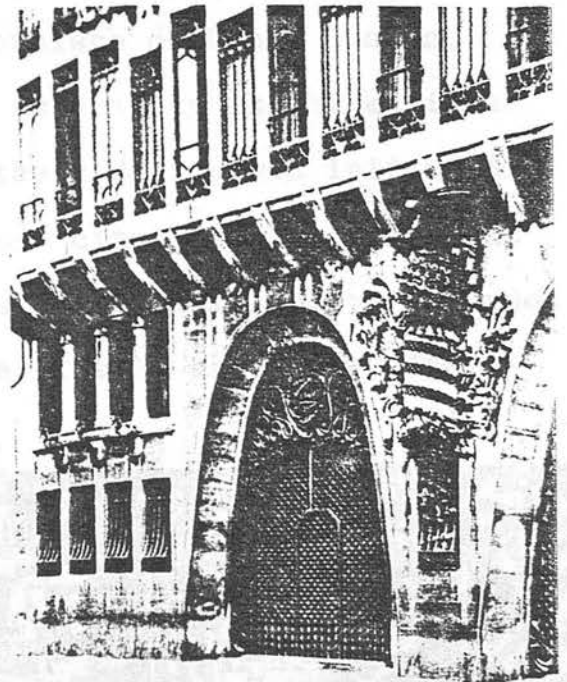
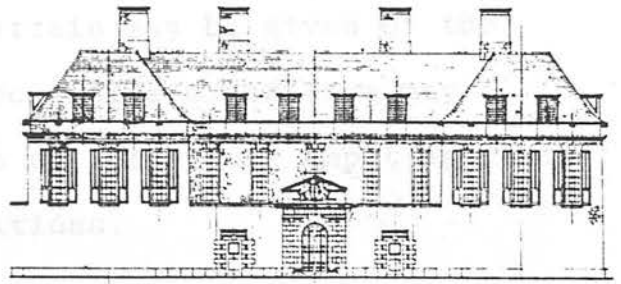
Top: Middleton Park, by Lutyens,
Oxfordshire.

Middle: Casa Guell, by Gaudi,
Barcelona.

Bottom: Villa Stein, by
le Corbusier, Garches.

It is interesting to note the relation between the main entrances to the buildings and the service doors. By changing the dimensions of the doors, Lutyens and Gaudi objectivated the relative significance of the two functions clearly. Apparently, le Corbusier had a problem since he wished to keep the elevation symmetrical while there was space for only one service door. To achieve a clear contrast between main entrance and service door, he needed to incorporate additional elements in the final solution.

FIGURE 65

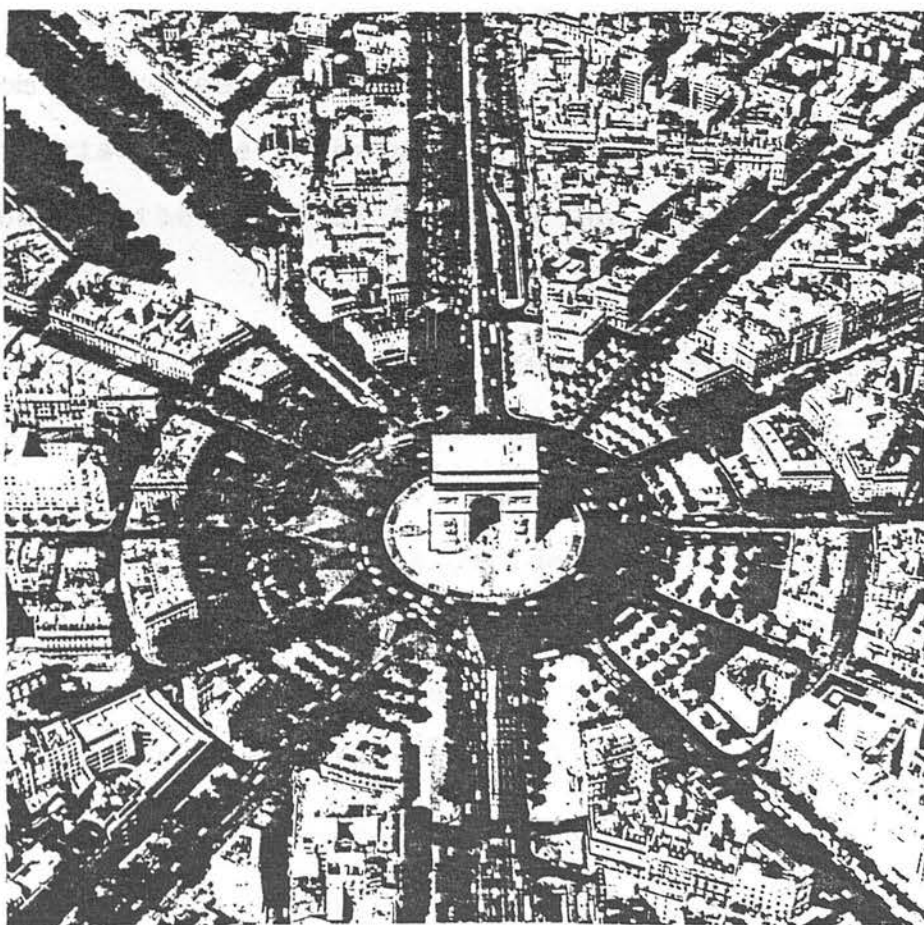


and legibility in existing environments in the sense that it has been discussed above. A measure of the extent that such a compilation could attain may be given by the extreme possible variety that cognitive experience may reach in terms of juxtaposition of perceptual input against schemata containing social relations.

At city level, Haussmann's Paris (Chapman, 1957; Pinkney, 1958; Crosby, 1973) is a masterpiece of Urban Design, among other things, in as much as clarity in the environment is concerned. Although their design was initiated for primary military reasons, the city's grand boulevards reflect its grandeur as well as its ambition to be regarded as the centre of the world (see Figs 27 and 66). The

The Arc de la Triomphe in l'Etoile is a typical Parisian landmark, the focal point of a number of boulevards.

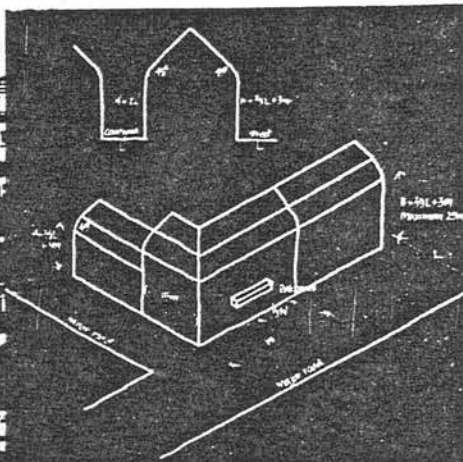
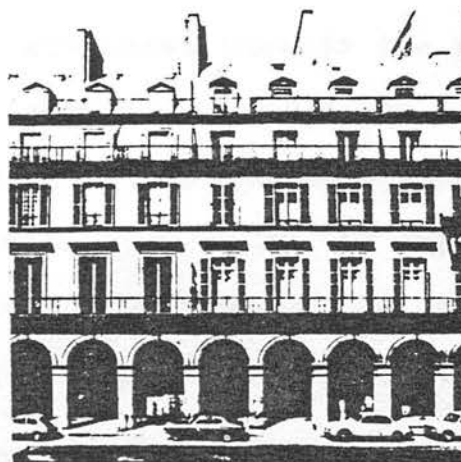
FIGURE 66



The system of boulevards is neatly interwoven with a series of elements which vary in shape and meaning (ranging from impressive monuments, such as l'Etoile, to vast vacant spaces, such as the Place de la Concorde, and incorporating the Seine as part of the design). These meaningful elements are properly situated in terms of clarity and legibility so that not only spatial but also social orientation is simplified, as both boulevards and focal points are clearly loaded with social relations stemming from the country's endless past and present history. Many of the elements of the Parisian landscape (Champs-Elysees, rue Rivoli, Avenue Foch) have such a distinctive character which is eligible of clearly representing land use and the social "physiognomy" of the surrounding districts. This is paired by the remarkable and by no means monotonous uniformity which is experienced from the street. The fact that only public buildings are to rise above a certain level is appropriate enough to strengthen the image of the city and its people as a whole (Fig. 67).

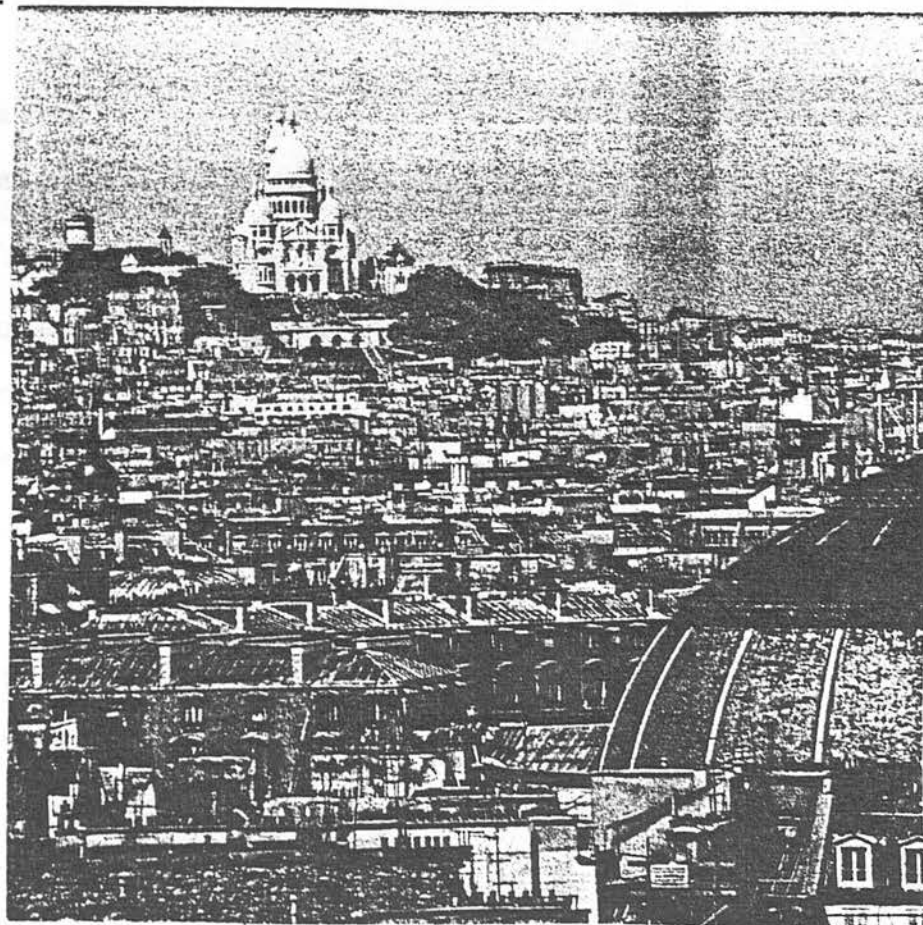
Clarity and legibility in the environment become remarkably acute when individual social relations which are dominant in the shaping of the particular environment are considered. As noted in 1.2.3, the transcendence of ideological social relations (and religion, in particular) in Florence allowed il Duomo to be disproportionate in respect to other buildings and to dominate the city's skyline (Fig. 25).

The City inevitably circled around it and, as the power of the church has always been significant in Italy, its dominance is still retained. Its image radiates both this



Regulations which referred to the building envelope ensured the impressive prominence of public buildings, like the Sacre Coeur, below.

FIGURE 67



fact and recent attitudes towards the past (e.g. conservation of architectural heritage etc.). Similarly clear and legible images reflecting analogous social relations of the wider social context can be experienced in an endless number of villages around the world (see Harvey, 1973, p. 32, for the typical 18th century English village).

Clarity can also be achieved through the juxtaposition of different environments (see also 2.4.2). These may form the context into which additional information is to be embodied without confusing the overall image. At an urban level, this can be seen in the case of Edinburgh city centre as this is probably one of the clearest inner city areas in the world for a city of its size. The core of the city is divided into three zones (the medieval city and the castle, the gardens and the Georgian New Town) which are separated by brief but imageable and understandable transitional areas (Fig. 68; see also the plan of the city centre in Fig. 27). All three zones are distinctly different as to the social relations they contain (e.g. the castle and the medieval mysticism, natural environment disciplined within the busy city with the railroad running through it as though in a rural landscape, the well ordered formal grid and the Georgian houses for the upper-middle class as discussed in 1.2.3 and so on).

The amphiteatrical layout which is sustained by change of level along the lines of transition allows the image to be grasped at a glance and its main components to be visualized both in their context and in juxtaposition with one another.

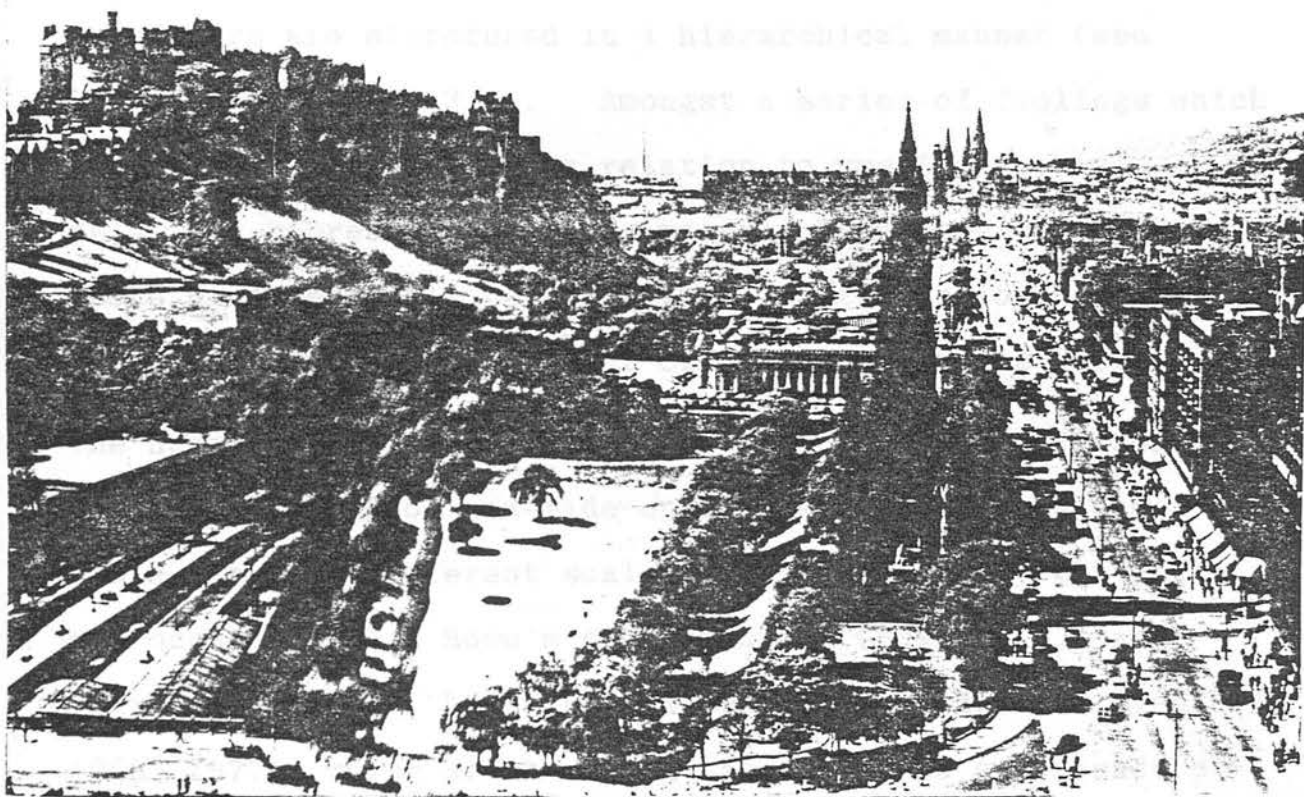


FIGURE 68

As the City Council's "High Buildings Policy" notes, the observer gets at once the impression of being in a special environment which is worth exploring in detail.

Such imageability makes it possible for additional information - and, above all, the extent to which present day society has decided to interfere either as a conscious "Act of Will" (Bacon, 1967), or through natural evolution - to be unobtrusively incorporated in the overall image.

Although there is an abundance of discrepancies among the features of the three domains, it appears difficult for any of them, even for the possibly confusing Princes Street elevation, to distort the image of the city centre as a

whole. In this sense, clarity does not contradict variety; on the contrary, these two may be complementary as long as signifiers are structured in a hierarchical manner (see Lozano, 1974 and 3.3.2). Amongst a series of feelings which a person may experience in relation to specific social relations represented in the image of Edinburgh city centre, there will generally be a feeling of satisfaction for his social orientation in respect of his cognitive needs.

The need for clarity and legibility in the objectivation of social relations on man-made environment applies to the whole range of different scales at which this objectivation may occur. Colin Rowe's contextualism (Rowe, n.d.) and Venturi's idea of "both-and" rather than "either-or" (Venturi, 1966, 1977), which are based on the cognitive experience of the juxtaposition of objects and contexts, relate to the whole range of architectural production. As it has been suggested in the illustration above, this juxtaposition appears to have to be designed in an ordered manner so that it is clear.

When the meaning of the overall image is to be strengthened, smaller scale components of the form may play an important role in elucidating it. In this case, instead of juxtaposition and ambiguity, there is an emphasis of the main theme. This can be seen in this rather long but dense passage by Charles Dickens.

"-Now, what I want is, Facts. Teach these boys and girls nothing but Facts. Facts alone are wanted in life ...

The scene was a plain, bare, monotonous vault of a school-

room, and the speaker's square forefinger emphasized his observations by underscoring every sentence with a line in the schoolmaster's sleeve. The emphasis was helped by the speaker's square wall of a forehead, which had his eyebrows for its base, while his eyes found commodious cellerage in two dark caves, overshadowed by the wall. The emphasis was helped by the speaker's mouth, which was wide, thin and hard set. The emphasis was helped by the speaker's hair, which bristled on the skirts of his bald head, a plantation of firs to keep the wind from its shining surface, all covered with knobs, like the crust of a plum pie, as if the head had scarcely warehouse-room for the hard facts stored inside. The speaker's obstinate carriage, square coat, square legs, square shoulders - nay, his very neckcloth, trained to take him by the throat with an unaccomodating grasp, like a stubborn fact, as it was, all help the emphasis.

- In this life, we want nothing but Facts, sir, nothing but Facts!"

from Dickens's "Hard Times"

Although the above passage analyzes signs which directly stem from a person's expressions, it can clearly be applicable to the signs in man-made environment, provided a switch is made to the appropriate codes. As it can be seen in the above illustration, it is not only the meaning which refers to the overall image that is strengthened. Peripheral meanings may stand out in an autonomy of their own in relation to the overall theme. These meanings clearly illuminate the dominant social relations and act as emphasizeers; in doing so,

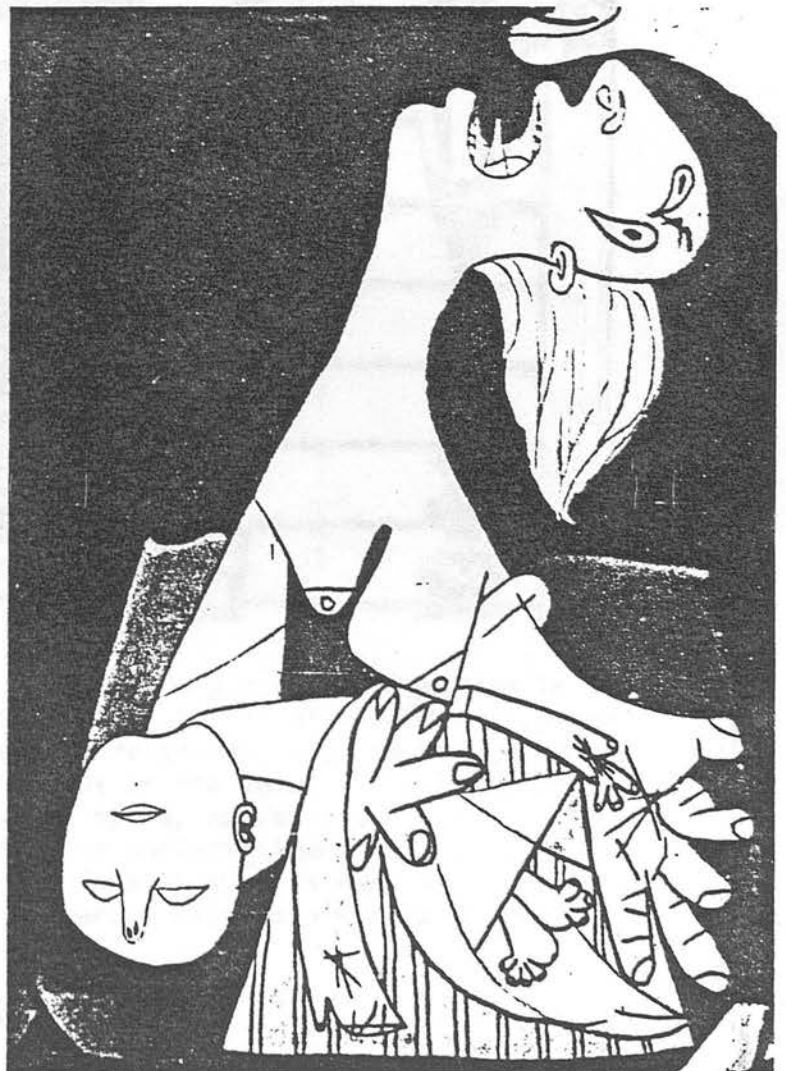


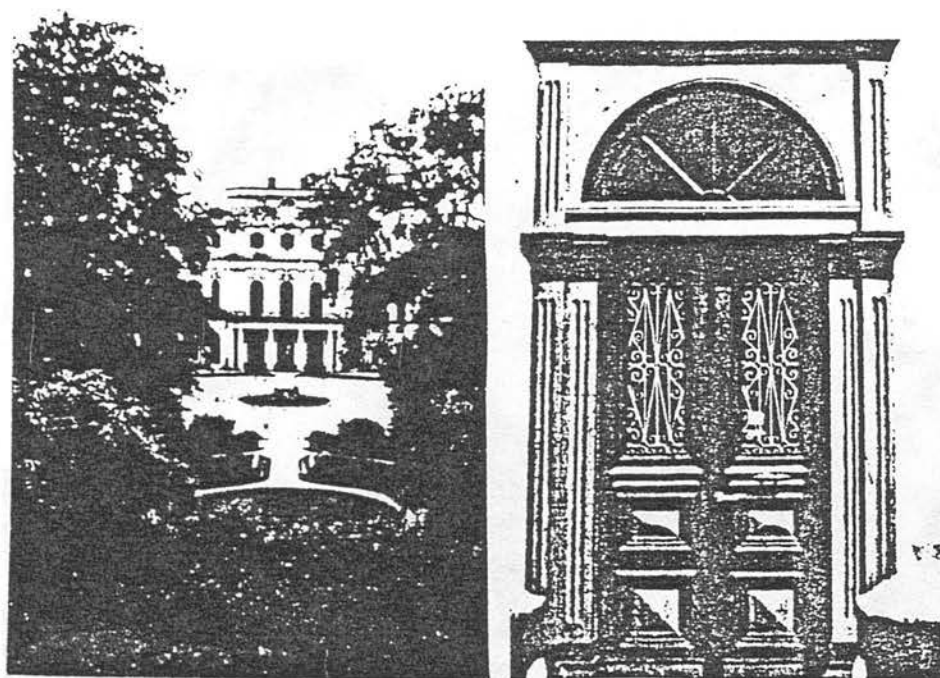
Above: A still from
"Potemkin", by
Sergei Eisenstein.

Below: Detail of
"Guernica" by
Pablo Picasso.

When the artist is in need
for a strong overall
message, details (like
hands, eyes, mouth, posture
and so on) are arranged
so that the social
relations they objectivate
are supporting the whole.

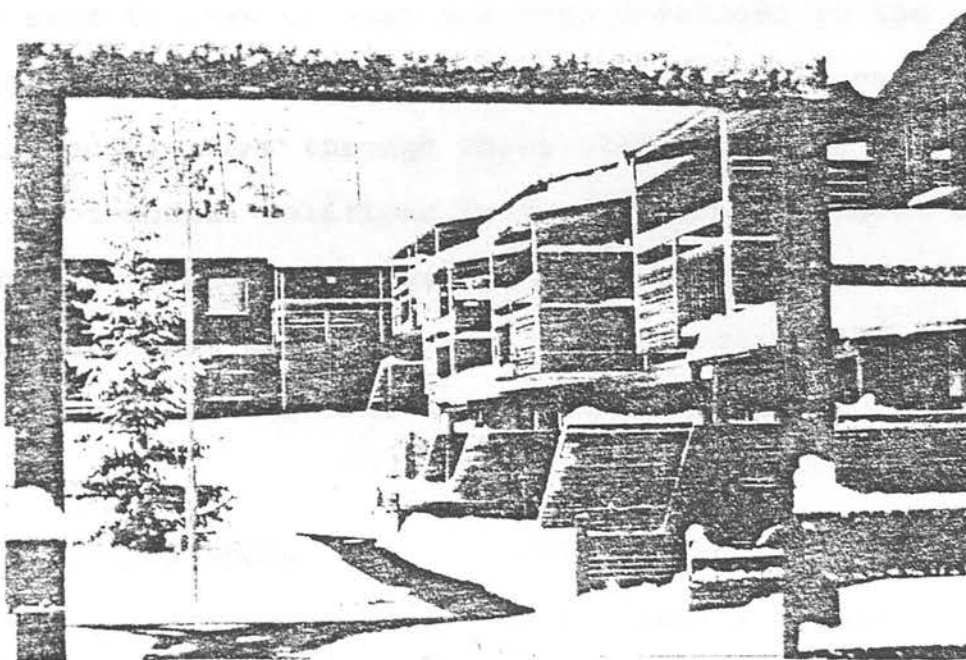
FIGURE 69





Baroque landscape design in environment's like the Residenz in Wurzburg, above left, adds to the legibility of the objectivation of important connotational social relations, such as the greatness of the residents. If one focuses on the detail, the elaborate entrance of a prominent house in Hydra, above right, aims to clarify the occupants' position in society (see also Fig. 40), while the colourful flower-bed in display by a bank in Edinburgh, below, attempts to add to the overall picture of the bankers' friendliness.

FIGURE 70



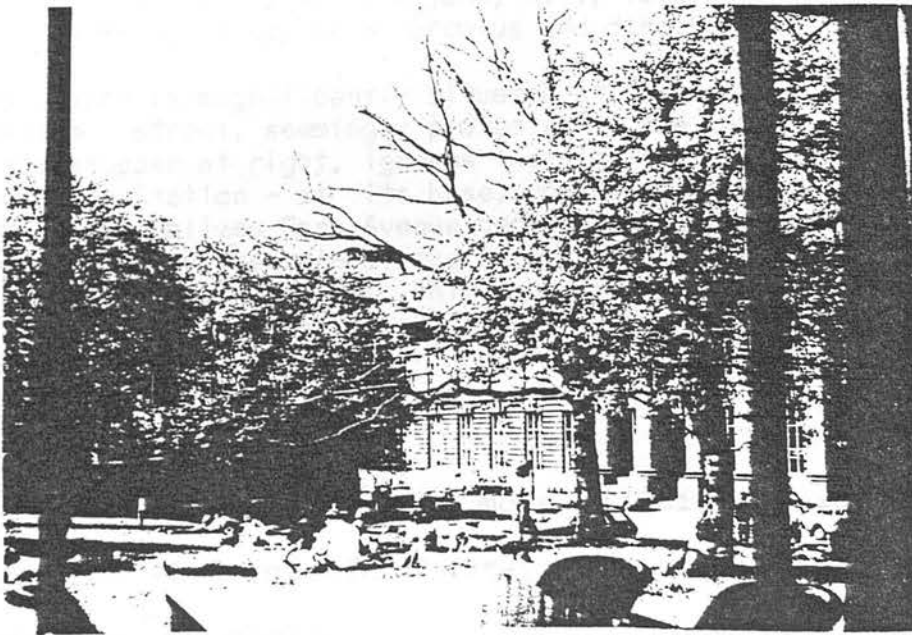
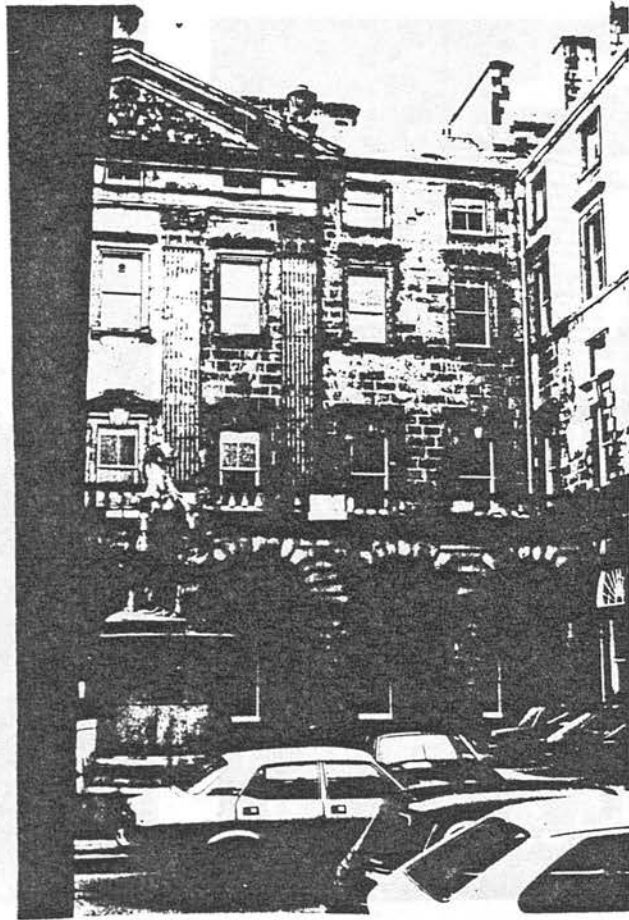
The occupants' identity is emphasised by as little as two pillars and the shaping of the surrounding wall in the house above (built by Lutyens in Ireland) or the gate over the entrance to the courts in the scheme below (designed by Erskine, in Bruket, Sweden).

FIGURE 70 (CONTIN.)

they also bring the characteristics of the components of the image in light. In this sense, social relations of the components become complementary to the central ones. Without them the overall image would have lost both in clarity and, according to what will be elaborated in 3.3.2, in variety.

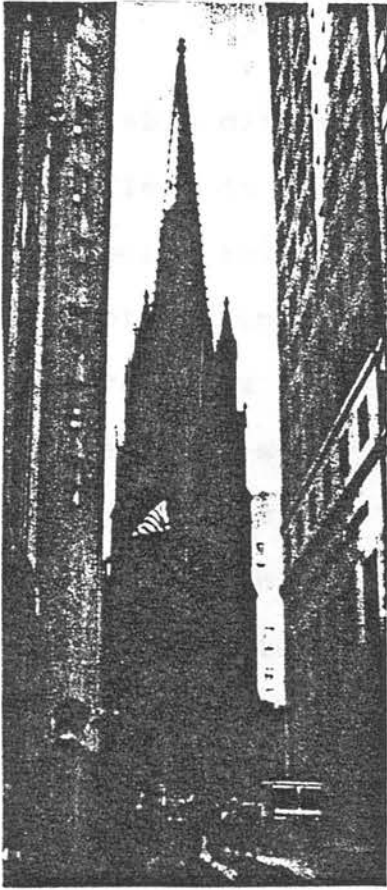
An extensive series of paradigms, suitable for illustrating how the designer can represent social relations on environmental forms clearly and legibly are given by studies such as the Essex Design Guide (1973) or Cullen's "Concise Townscape" (1961). In his insightful book, Gordon Cullen deals with aspects of urban imagery such as defining space, focal points, vista stoppers, enclosures, the distinction between hereness and thereness and so forth. When these are seen in view of what has been discussed in the present study, they acquire new dimensions since they can be regarded as ways through which clarity in the representation of social relations in the urban environment can be achieved. Under this perspective, a carefully designed enclosure aims at reinforcing the objectivation of social relations characteristic of the enclosed space (Figs. 71, 72).

Similarly, a whole series of Cullen's illustrations relate to the clarification of the environment's potential informational content. In this sense, instead of being an array of "gadgets" which the designer should remember to incorporate in his designs to make them interesting, they can be considered as part of the broader family of codes which are essential to achieve clarity in urban design.



The enclosed space, surrounded by the buildings of the Art College in Edinburgh (below), constitutes an additional level at which the feeling of "homeness" and "security", provided by the institution, is expressed. A similar observation could have been made with regard to the internal courtyard of the City Chambers (above), if not for the hard landscaping and the different way in which it is being utilized. This particular enclosure clarifies the official business-like atmosphere of the institution.

FIGURE 71



Left: Trinity Church, by R. Upjohn, N.Y., 1846.
 Right: Pan Am Building, by W. Gropius and others, N.Y., 1963

Trinity Church is magnificently situated at the culmination of a long canyon-like street, seemingly protected by the walls of skyscrapers. The vista stopper at right, ignores the dignified old structure - Grand Central Station - at its base, dominates the buildings around it, and depersonalizes Park Avenue because its appearance is too low in content to play the role of the strong signifier needed for this central spot. In this sense, this landmark fails to concretize the social relations it contains in a legible way.

FIGURE 72

Meanings will be transmitted more efficiently and the built environment will function better as a domain through which man experiences the world.

After elaborating on the background knowledge concerning clarity and legibility in view of what has been discussed in the first two parts of this study, let us now concentrate on several issues that arise from designers' everyday practice. What clarity and legibility suggest is that

noticeable differences in the amount and nature of possible signifiers in the environment should be in accordance to the social relations they represent. The designer must attempt not only to clarify these semantic relations but also to strengthen noticeable differences in signifiers based on the relative significance of their signifieds. In other words, the designer is responsible for the manipulation of information in the environment so that the meaning is not only crystallized and reinforced in all levels, but also that this happens in a hierarchical way. This is another reason for the designer to know the context in which he operates and the groupings of the personal parameters involved.

Let us assume that a huge tower block overshadowed Edinburgh Castle. No matter how clear the city's image is supposed to be, it appears reasonable to assume that such an event would have altered it dramatically. Although the construction of the new tower block would possibly arise adverse feelings, strictly speaking it might have been a clear and legible reflection of changes in the values of society and the power structure in the city. As such, it could have been acceptable given, of course, the wholesome change in the social context. If, however, permission for rising high was granted, say, incidentally and under the present socio-ideological structure or if new buildings were still rising above the town but not enough to overpower the castle, then the image would have been unclear and confusing.

In every-day life situations having to do with the production of environment, social relations can be so many and so varied that it may sometimes appear extremely difficult for the

designer to come to an understanding as to how they are hierarchized (see Fig. 65). It is not seldom that architects overestimate the position and relative significance of their project as regards its context. Buildings, which should have been unobtrusive if the city was to be legible, end up possessing unjustifiable prominence. In view of this, it seems that the architect must be aware of the whole potential informational content of his designs in order to achieve clarity at different levels. It is needless to say that this is to be attempted bearing the users', rather than the designers', needs in mind. On the whole, and in view of table 2.4.2, one may argue that what the designer should aim at, by employing clarity and legibility in his designs, is to eliminate transmitters' sources of noise.

3.3.2 The Need for a Balanced Perceptual Rate

The Importance of Personal Parameters and Man's Cognitive Needs

It has been proven that sensory deprivation or the denial of sensory stimulation can lead to many strange mental and physical effects. In the 1950s a number of experiments in sensory deprivation were held at McGill, Princeton and other universities in which volunteers were isolated in a "black room", a small, completely light-proof, sound-proof and constant temperature cubicle, where all normal sights and sounds were missing, to test their reactions to silence, solitude and restricted movement. It was generally found that most subjects soon went to sleep in the extreme darkness and silence, but when they awoke they had difficulty in keeping

their minds occupied. The idea that one can use the opportunity provided to think deeply and solve problems was proved erroneous. In some cases the subject was unable to maintain a consistent line of thought, since ideas that came would quickly evaporate. In other cases some quite innocuous idea would arise in the mind and intrude itself so insistently upon the consciousness that the subject unable to shake it off would press the panic button (Vernon, 1966). The human mind needs some flow of information from the environment in order to survive. Normal consciousness, perception and thought can be maintained only in a constantly changing environment; where there is no change a state of sensory deprivation occurs.

From what has been discussed in 2.1 and 2.3.2, and especially from the elaboration of the point in which accommodation dominates assimilation and vice versa, it follows that individual cognitive needs may be expected to ask for the amount of experience to be increased or decreased over certain periods of time. Seemingly, there is an individual need for some perceptual rate and this need depends on the individual's personal parameters and varies with time. As an overall view, one may say that the same person in the same environment will tend to receive a different amount of stimuli at different moments of time.

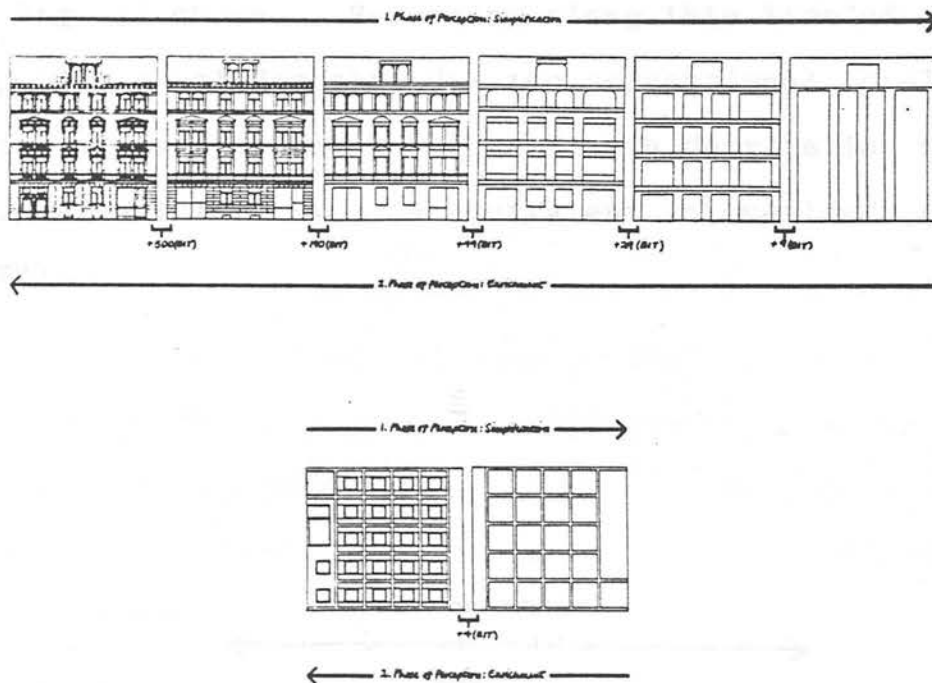
The question that arises at this point - and has served as the focal point for a growing discussion among researchers on the field - is how high or low can this flow get. In other words, how can one trace the limits within which this flow may fluctuate given the fact that people function best

and with minimal psychological costs at certain levels of stimulation with both too high and too low levels undesirable (Rapoport and Kantor, 1967).

In his study on "Human Aspects of Urban Form", Amos Rapoport notes that "information is defined as that which removes previous uncertainty and is composed of 'bits'. One 'bit' of information is that amount needed to make a decision between two equally likely alternatives and every time the number of alternatives is doubled one 'bit' of information is added" (Rapoport, 1977, p. 195-196; Crosby, 1973, p. 78, for 'binary digits'; see Fig. 73).

Based on this definition of information, Rapoport uses three concepts of information theory in his approach; namely, the amount of information, redundancy, a response to selective qualities of the human brain (see 2.2.3), and channel capacity, i.e. "the upper theoretical limit to the rate of information processing in any system including people". That is, he is mainly concerned with environmental parameters and, in doing so, he is implying that they are basically responsible for people's level of stimulation. In fact, apart from the concept of channel capacity, which in itself is basically quantitative in nature, his only allowance for the significance of personal parameters in relation to the perceptual rate is his acknowledgement that "in all this, adaptation plays a role".

Such an overvaluation of the environment's role in perceptual experience is not very much in accordance with the rest of



Theo Crosby explains how "binary digits" as features of a form are added or subtracted from its elevation so that it is enriched or simplified.

FIGURE 73

Rapoport's work; one can possibly come to such a remark as regards the anthropological approach to perception which he adopts in his numerous case studies (see also 2.0). When his overestimation of the environment's role in perception is combined with the dichotomy between the "perceptual" (i.e. "visual" or formative) and the cognitive level of perceptual experience and the under-rating of the significance of the latter, then the man-environment relationship is deprived of many of its dynamic elements (see 2.2.3). It entails the danger to be reduced to a mere mathematical issue the inevitable solution of which is a symmetrical one; that is, one in which the two extremes lie the same distance apart from the golden average,

as Fig. 74 shows. Reasoning along this line of thought, Rapoport concludes that "at the perceptual level, inadequate information can be equated with deprivation while excessive information is equivalent to overload" (Rapoport, 1977).

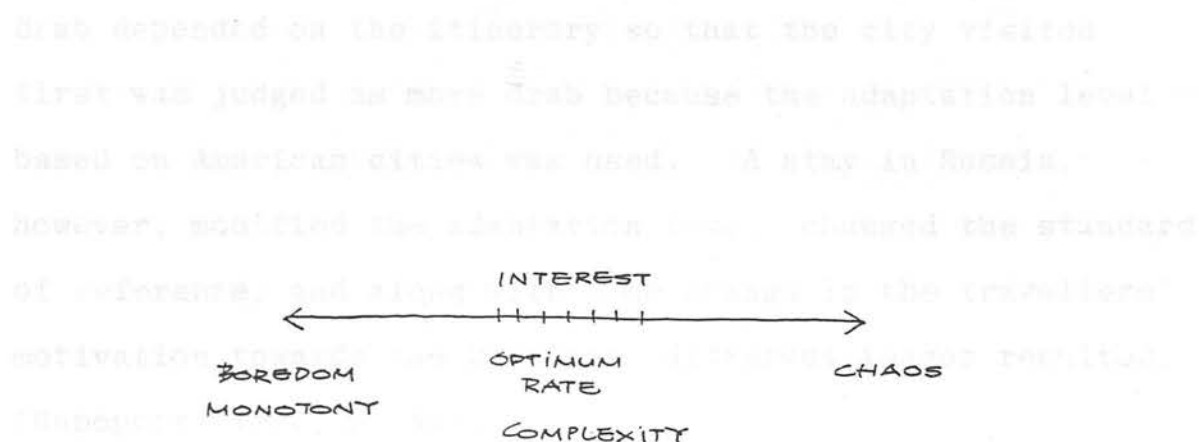


FIGURE 74

Let us once again consider the role of personal parameters in perception. As we have seen above, each individual perceives his environment according to his past experience and motivation, his state of mind and his course of action at the particular moment in time. The same environment may be evaluated as overcomplex or not, depending on discrepancies in previous experience, motivation and so on in view of people's cognitive needs at the time. For example, a cable room in a telephone exchange building will obviously tend to be experienced differently by the operator than by a layman; the layman's image will depend largely on his motivation and attitude at the time (whether, say, he

is just looking at it or he has to take over the operator's job), to say nothing of the meaning his past experience allows him to invest in the complexities he perceives.

Also, as Rapoport notes, for American travellers in Russia whether Leningrad (Fig. 75) or Moscow were judged as more drab depended on the itinerary so that the city visited first was judged as more drab because the adaptation level based on American cities was used. A stay in Russia, however, modified the adaptation level, changed the standard of reference, and along with some change in the travellers' motivation towards the Russians, different images resulted. (Rapoport, 1977, p. 53).



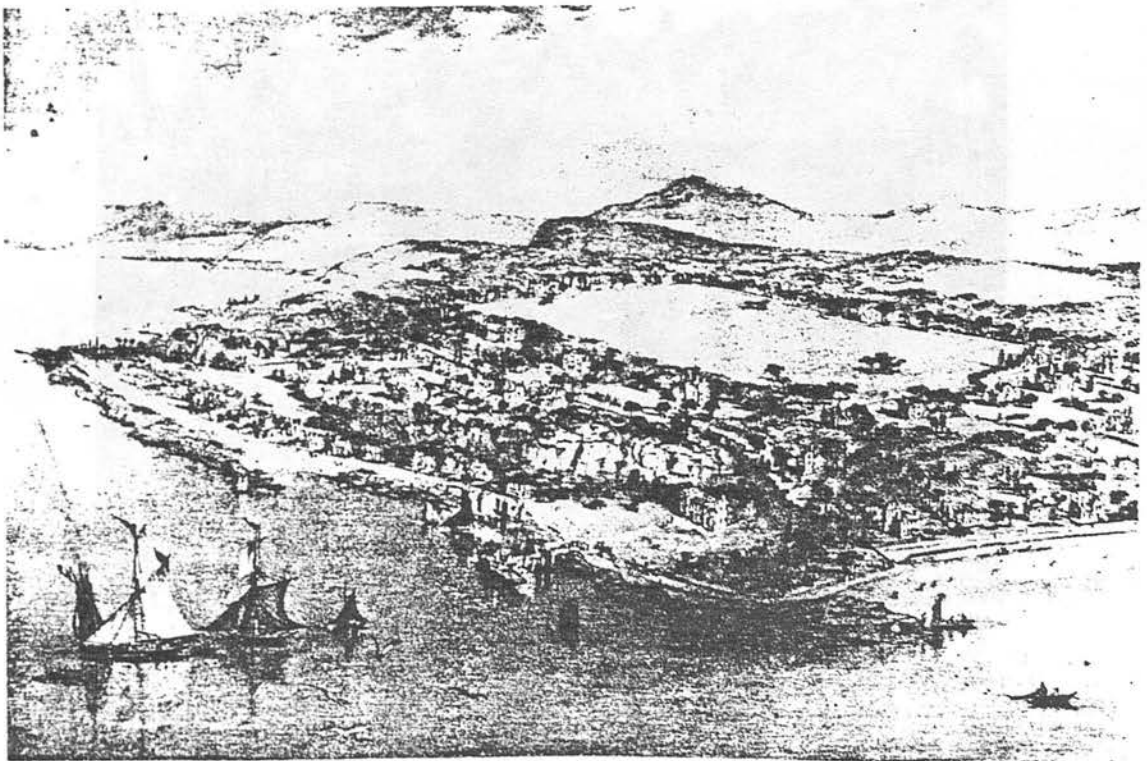
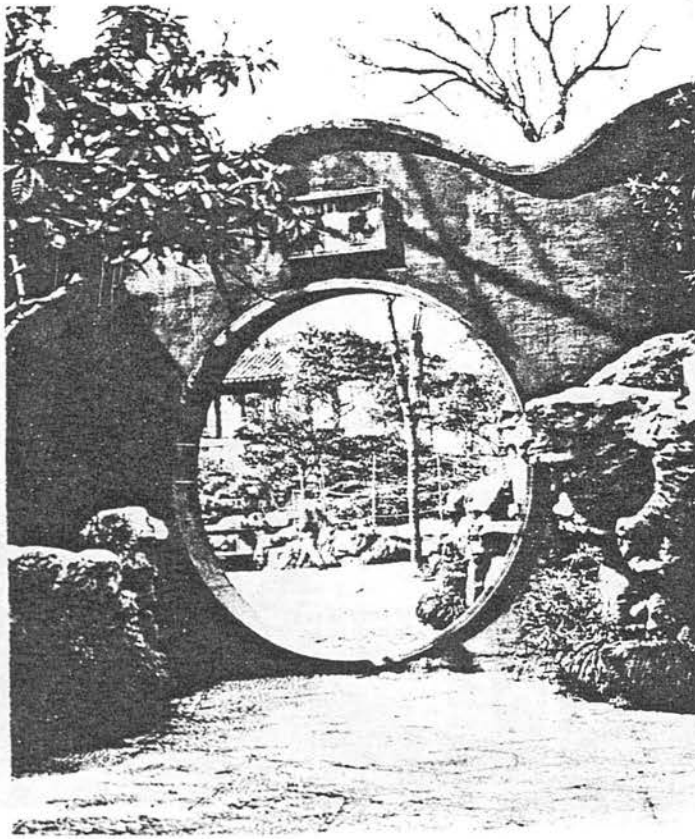
FIGURE 75

In another sense, an environment which is generally characterized as pleasant and interesting may often be experienced

as boring if perceived under certain states of psychological composition. No matter how skillfully a tourist resort or a chinese garden might have been designed (Fig. 76), if one is in a peculiar mood they will appear unpleasantly monotonous - if not worse because other people are enjoying themselves while this person can not.

As underlined in 2.4, the environment alone can not determine experience. In this sense, even if it is stacked with representations of social relations it may still be experienced as boring. Although the illustrations given above may be said to be extreme and idiosyncratic, they clearly demonstrate the extent of personal parameters' dominance over both the rate of perceptual input and image formation.

It appears that, at any given instant, a certain relation is established between each individual and his immediate surroundings that is the individual's personal space (Lewin, 1964, pp. 238-240; see also 2.0 and 2.2.1). As this relation is a function of the particular configuration of the person's parameters at the time, it sets the perceptual rate expected. In this sense, monotony and overstimulation may be the outcome of the usually unconscious juxtaposition of the particular environment experienced to what was expected from the social environment it contains and represents. One expects city centres to be rich in stimuli, a lot of which will usually demand people's attention, whereas in residential areas stimulation is generally expected to remain in lower levels (Fig. 77). Hence, environments will tend to be experienced and judged according to the



Although Chinese gardens are designed so that they are interesting and intriguing, the discussion in 2.4 points out that it must not be expected that they will always be experienced as such. The same applies to idyllic environments like the 19th Century estuarine suburb of Glasgow, portrayed below by a developer.

FIGURE 76



Down-town areas, like the one above, are expected to be more stimulating than the residential quarters in a city.

FIGURE 77

standards set for each category of them and not according to unified ones.

Given the probabilistic nature of perception and the transcendence of personal parameters over environmental ones, one may argue that there is no monotonous or overstimulating environment as such. It is only that, statistically, some environments may prove to be evoking monotony or overstimulation more often than others in respect to the social environment they represent. Since every situation carries its own dynamic, the designer must be rather sceptical before listing environments under already formed categories. The knowledge of the groupings of personal parameters of the users, and especially the understanding of the form their cognitive needs may take, is essential to come to a conclusion as to the degree in which the amount of information incorporated in his designs may be expected to be experienced.

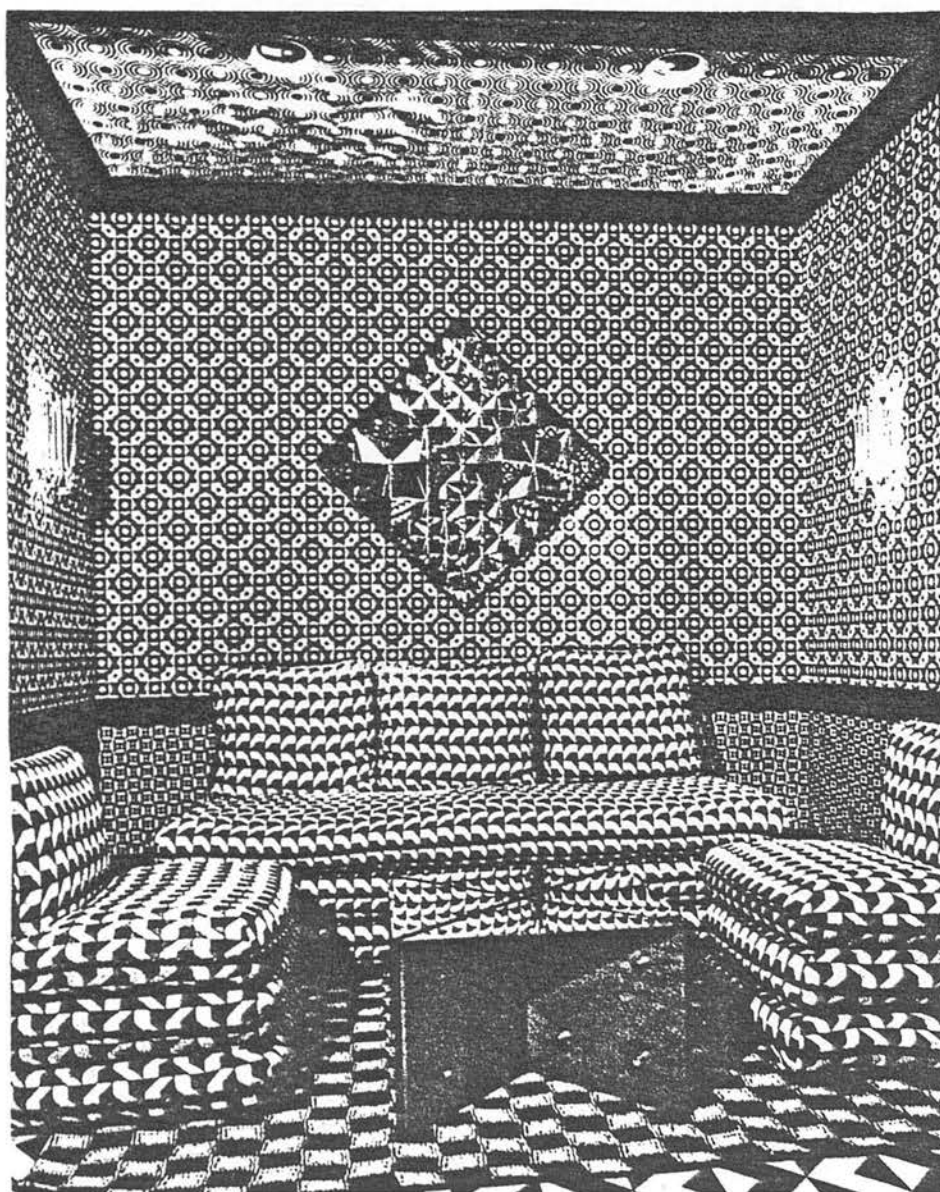
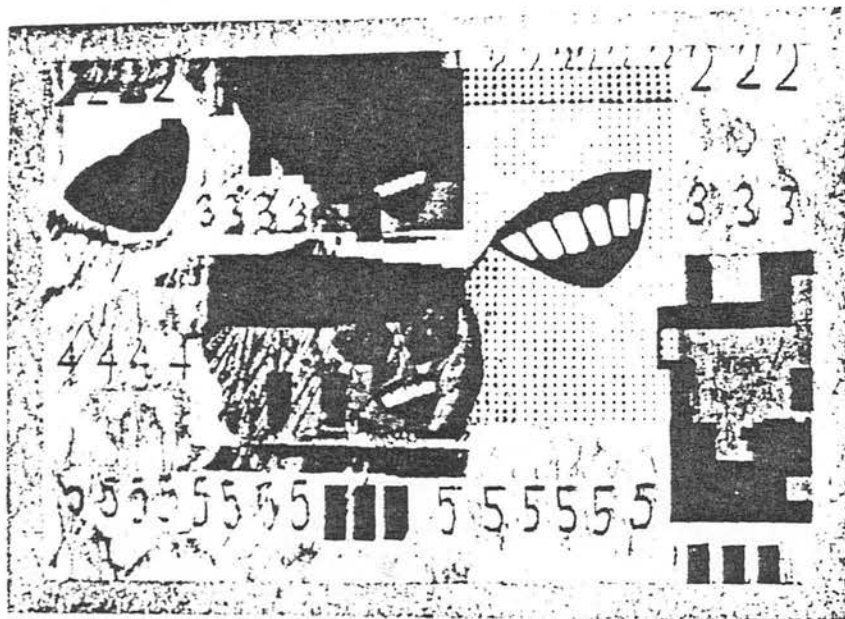
The Need for a Balanced Perceptual Rate in View of the Representation of Social Relations on Man-made Environment

So far it has been shown that the actual flow of information from the environment is expected to vary with time because of changes in the individual's personal parameters and the particular relation he establishes with the environment he finds himself in. As laboratory evidence has suggested, it appears that, despite small individual variations, there is a consensual point of visual preference among people as opposed to a random scatter among individuals (Rapoport and Kantor, 1967, quoting Streufert and Schroeder, 1965).

The complexities of cognitive experience, part of which remains below the threshold of consciousness, make it impossible for this optimal rate to be measured. And even if this happened, it would be equally practically impossible for a certain design to incorporate such an amount of information. In any case, dominance of personal parameters would drastically affect such an "efficient" setting. What can be done, however, is, once the role of personal parameters has been set, to come to an understanding of the nature of the function in as much as stimulus parameters are concerned, in view of what has been discussed in the previous parts of the study.

As the human mind is testing stimuli from the environment against ordered mental schemata containing social relations, information in the environment is ordered and differentiated according to some notion of what it stands for. As noted in the second part of this study, although the retinal image of an object maybe a mosaic of discrete pinpoints of light of varying wavelengths, people experience the environment according to the first aspect of selectivity: they see distinct objects loaded with social relations. Therefore, there is never just an array of stimuli in the environment since stimuli tend to be grouped in patterns in respect of their capacity of evoking meaning (Fig. 78).

In this sense, one may only conventionally refer to 'bits' and the amount of information in the environment as such, since they are paired with the social relations and mental schemata they correspond to. From the approach in 1.2 it



Although the numbers of repeated patterns in the otherwise ordered living room below (designed by Seymour Avigor in 1969) are probably less than those in the piece of tapestry above (by Helen Gibbs, 1981), it may be argued that the interior design is more complicated and, hence, more tiring than the tapestry since it is lacking the social relations which would have made it interesting and easily graspable.

FIGURE 78

can be deduced that differentiation in form, even if regarded in groupings, does not come into a one-to-one relationship with the social relations behind it. This is complicated further once meanings, invested in environmental forms after their production, are taken into account. This point provides enough cues to suggest how insufficient, if not erroneous, the method of using the binary digit ('bit') and information theory aspects alone may be. Apart from ignoring the dominance of personal parameters, they are only quantitative and do not take into account the fact that it is highly likely for 'bits' to vary extremely in density of meaning.

According to an approach based purely on information theory, the pyramids in Egypt would have been classified as boring whereas it is obvious that for most people in this world, despite their simplistic look, they are notably dense in the social relations they represent (Fig. 79). Experiencing them would imply the activation of various cognitive and evaluative systems of schemata on many different levels and dimensions. Clearly, image formation will not only be based in relation to the particular society the pyramids represent since it may be expected to involve a lot of fourth level imaginatory transformation.

On the other hand, modern housing estates, as well as quite a few down-town modern "anonymous" buildings and their surrounding area, are very often experienced as depriving and even alienating, although they may be "visually" richer than the pyramids, or small vernacular houses, in terms of

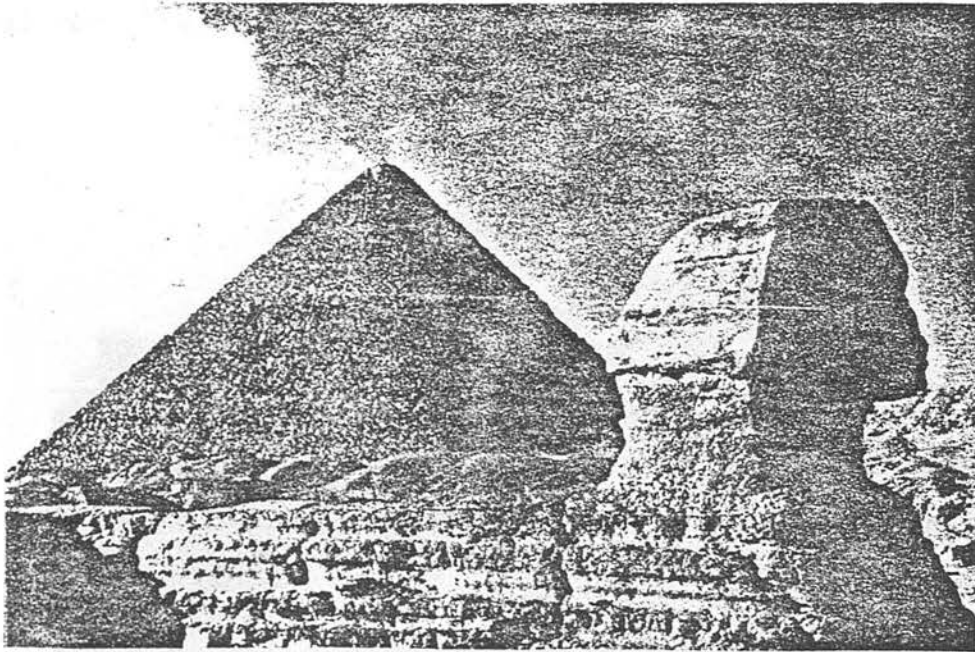
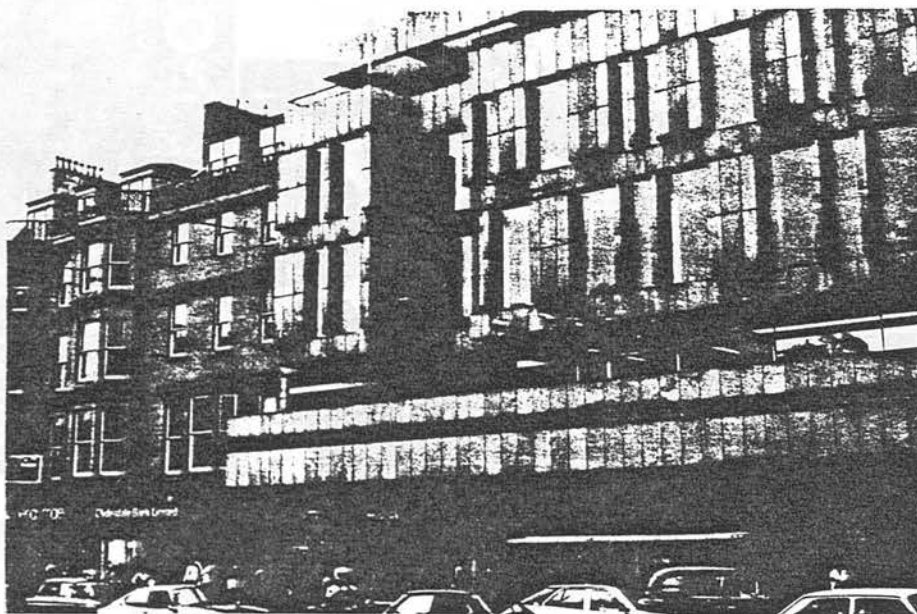


FIGURE 79

intricacy in design. As far as environmental parameters are concerned, the reason to explain this lies within the stimulus capacity to trigger a wide range of schemata. We have already discussed the tendency designers have to regard cognition as merely relating to man's operational needs (see 3.2.1). The natural complexity and ambiguity, which are to be found by the particular configuration of social relations that characterizes such buildings' social environment, are very seldom registered in the resulting form. Noticeable differences are comparatively few and, when they do not relate to the social relations they might have represented, they remain unclear. Some intended diversity that designers of such environments often feel obliged to incorporate in their designs generally ends up being nothing more than what

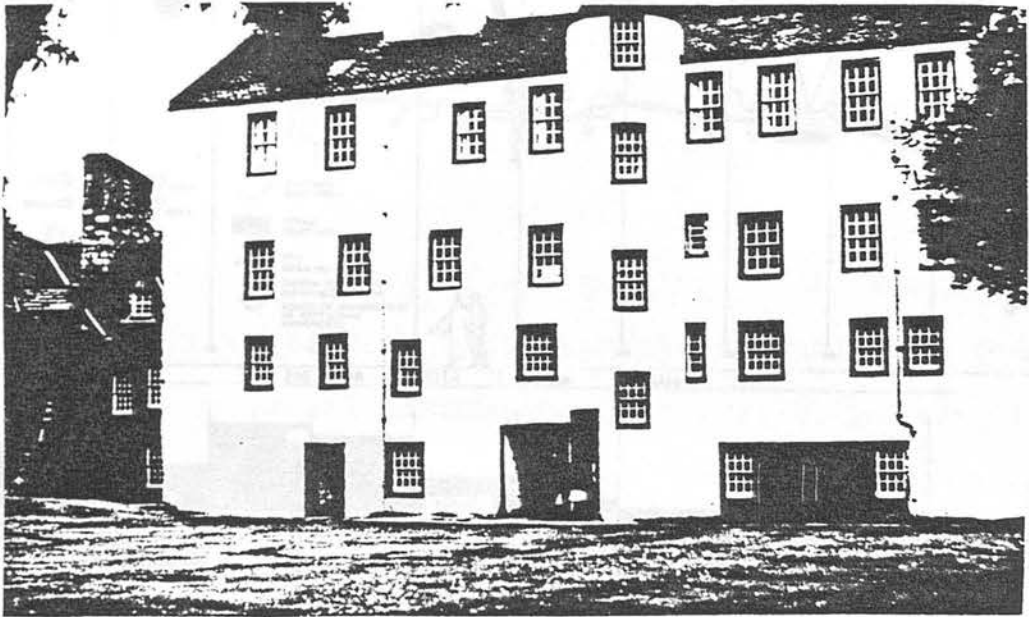
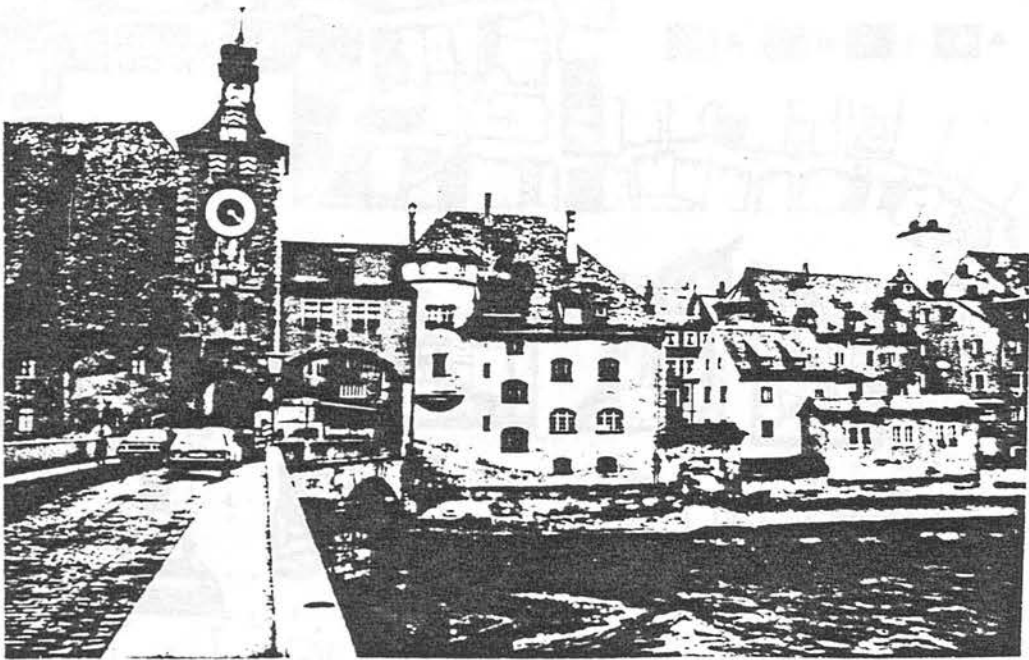
it was (e.g. a personal "toy" to play with) and stays shallow (Fig. 80).



In the elevation of this office building in Princes Street, Edinburgh, it appears as though complexity has been imposed by the designer.

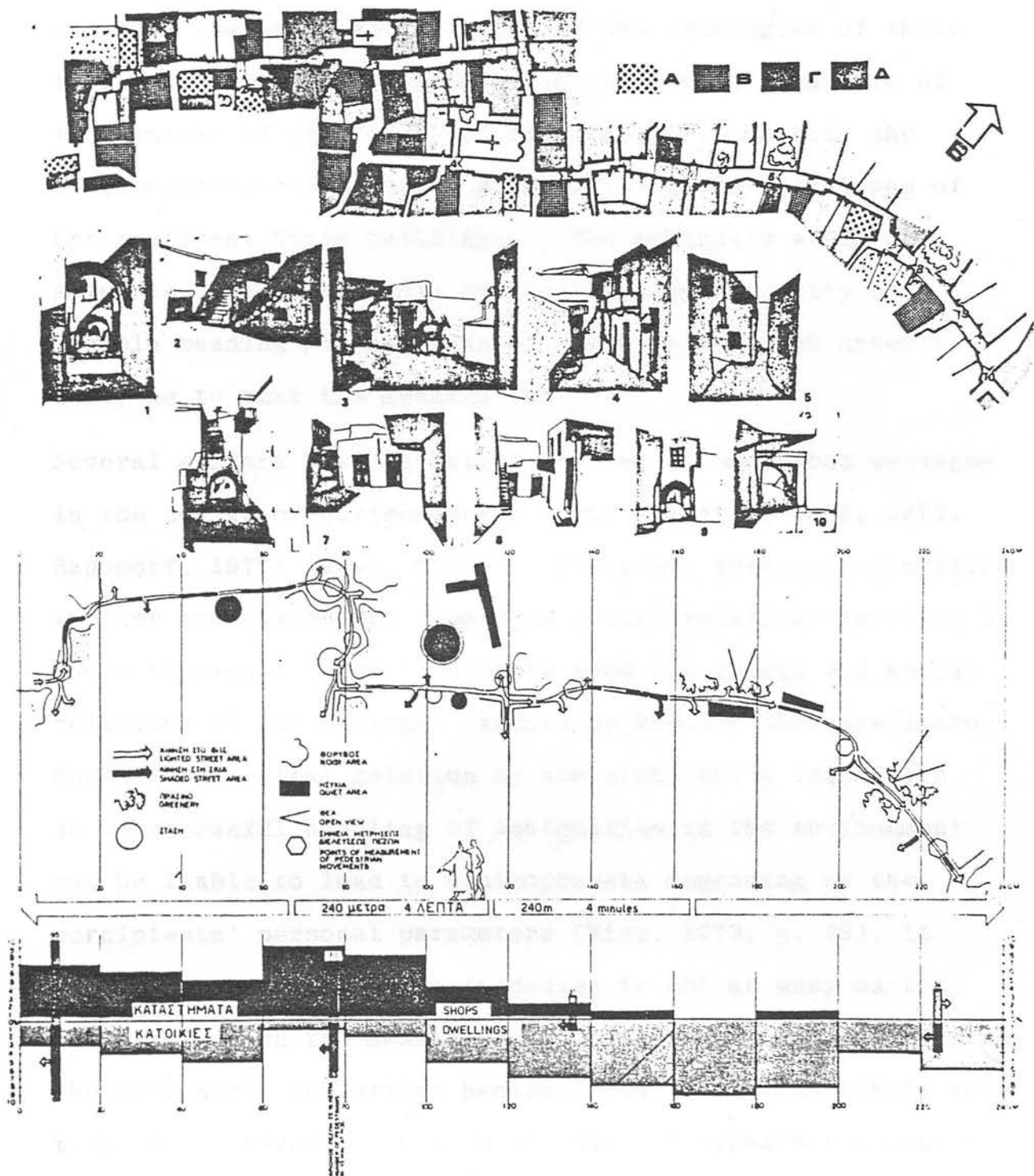
FIGURE 80

In traditional architecture, on the other hand, partly for reasons of availability of materials and technology and partly for reasons stemming from the ideological and social structure of society, signifiers are much stronger. They are loaded with denotational meanings of the primary functions and, as these primary functions come into a complex amalgam, they compose an overall image which is not only clear but also maintains a strong element of diversity and complexity (Fig. 81 and Fig. 82). Such diversity and complexity, based on social relations of primary functions



Not only by this scene from Regensburg, Bavaria, above, but also when contemplating the apparently simple building below, one is expected to be intrigued by the interrelatedness of the functions they contain.

FIGURE 81



Analysis of the main pedestrian street in the island village of Naxos, Greece.

In the comparatively short distance of 240 metres, streetscape unfolds itself in an immense variety of recurring scenes.

FIGURE 82

and to a lesser extent on those of the ideologies of these functions, are deeply rooted into the social relations of the context of the forms and have little to do with the often meaningless patterns which fill in the elevations of International Style buildings. The ambiguity which may arise is usually a result of "contrast or duplexity of legible meaning", rather than of "doubtfulness and uncertainty as to what the meaning is".

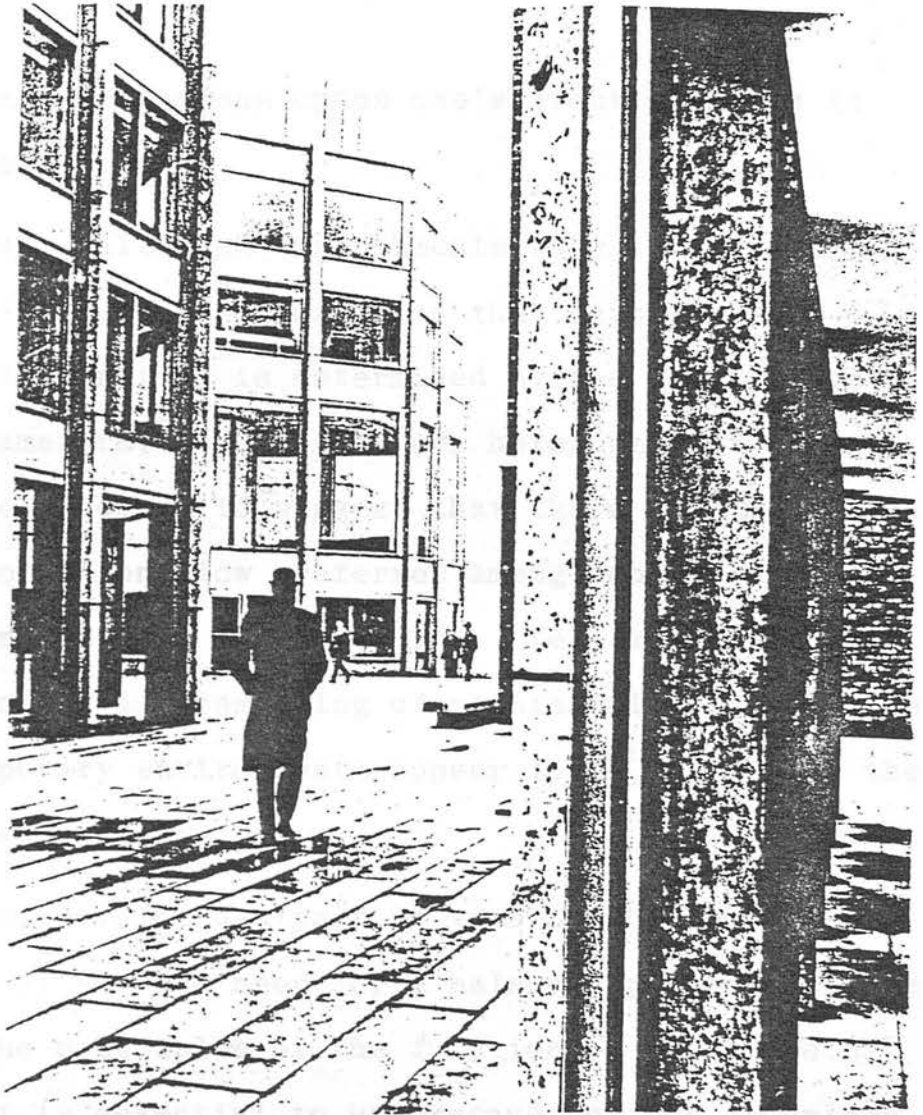
Several writers have advocated the use of ambiguous messages in the design of environmental forms (Venturi, 1966, 1977; Rapoport, 1977; Rowe, n.d.). It is not generally clarified whether these messages stem from social relations involved in the situation at hand (composite need for change and social relations of the external factor) or whether they are introduced in the final solution by the architect's initiative. As unsuccessful handling of ambiguities in the environment may be liable to lead to schizophrenia depending on the percipients' personal parameters (Wing, 1978, p. 28), it seems that its employment in design is not an easy matter; especially when the meanings are added on the forms following the designer's intentions because, then, it is less likely for them to be shared. In view of this, it appears reasonable to argue that the use of ambiguity is to be accompanied by a deep understanding of the function of cognitive experience in relation to man's cognitive needs as well as by a good knowledge over the user's personal parameters. More specifically, ambiguity is to be regarded in direct relation to the properties of clarity and the juxtaposition of objects

and contexts.

Before ending the discussion on the optimal perceptual rate, let us take an overall view at the possibilities to have either monotonous or overstimulating environments in contemporary cities. It can be argued that in modern societies these two are not symmetrically apart from the optimal rate; at least, in as much as design practice is concerned.

There are two arguments involved in this and both point at the fact that designers must be more cautious to avoid monotony than to oppose overstimulation. The first reason has already been mentioned earlier and relates to the economical basis of contemporary production of environment and the tradition of the International Style. The fact that the emphasis lies mainly on profit-making limits the budget and restricts the scope of designers. The result is that environments merely satisfy the operational aspects of the composite need for change (e.g. housing, cooking, sleeping) and no allowance is granted in respect to the function of their image and man's cognitive needs. As many writers have noted, cities around the world are becoming increasingly similar. On top of this, the percipient very seldom seems to believe that the designer "outdid" himself (as it might have happened more than a century ago). In Crosby's words, "it is just a human mind stretched too far" (Crosby, 1973). In addition to monotony, a feeling of rejection and the realization of "motivation conflict" in present day societies reinforce the basis for alienation (Fig. 83).

FIGURE 83



The fact that the danger in our societies lies in monotonous rather than overloaded environments is supported by another reason. As Rapoport points out, apart from avoiding the particular environment man may use filters to cope with overload. He instinctively switches off a part of his mind without grave psychological costs (Rapoport, 1977, p. 336). In this sense, a monotonous environment would ask for excessive fourth level experience, i.e. imaginary transformation of the image. But, as this may understandably be frustrating and soul destroying, there is not much one can actually do apart from avoiding the place. The question is what happens when one meets monotony and

deprivation as soon as one opens one's front door, as is often the case?

To recapitulate, although environments vary largely in the amount of potential information they contain, the actual information flow is determined by the percipients' personal parameters, cognitive needs being part of them.

There is some evidence to suggest that there is some optimal range of information flow preferred among people, especially as regards anticipated environments. Yet, as information is to be regarded as consisting of meaningful "bits", quite a few contemporary environments appear to be well below the optimal perceptual rate.

The first task for the designer in view of the above is to become aware of how the need for a balanced perceptual rate relates to the principles of the function of the image of objects. It is essential to understand how the groupings of personal parameters, in view of the users' cognitive needs, allow, say, a supermarket to appear potentially more stimulating than a convent as far as complexity in the environment is concerned. In doing this, one should bring personal parameters in relation to the setting in order to come to the necessary conclusions about people's expectations.

With this as a guide, a long series of the social environment's interacting and conflicting social relations are to be objectivated in signifiers. Their nature will tell whether this will occur as a denotation or a connotation. In this way, primary functions and their ideologies,

incorporating elements that the designer may possibly want to stress, are more liable to be portrayed meaningfully and distinctly. Conflicting and interacting social relations in the environment will correspond to conflicting and interacting signifiers.

3.4 A COMMENT ON THE DESIGNER'S ROLE IN SOCIETY

From what has been elaborated in the first part of the study, it follows that the design process should comprise two principal stages, namely

1. Analysis - the identification of a composite need which asks to be satisfied and,
2. Synthesis - the implementation of the means (e.g. an environmental form) to satisfy this need.

A whole series of factors and relationships interfere in all three phrases of the "life" of such an environmental form - e.g. before, during and after its production. These factors and relationships may range from availability of money and materials or decision-making and conflicting values and priorities amongst the designer, the employer and the client, to more or less purely ideological relations of the time (e.g. the latest trends in the designers' established vocabulary etc).

The designer's profession has to be seen as functioning within a context. This context is set by social relations at all levels in a given society (economic, ideological, political etc.) and, of course, it changes with time. The aforementioned intervening factors and relationships are nothing

but the impact the context has on the process of the production of environment and a significant part of them, as noted in the first part of the study, lies beyond the designer's reach. Both the extent of the context's impact on the architect or designer as well as the influence the environment they create may have on people have been widely discussed.

Designers tend to take two opposing attitudes with regard to their working context. Some of them have come to the point of suggesting that the limitations which stem from this context can be so overwhelmingly solid and restricting that the architect is left with practically no choice at all (see the first part of the study for deterministic stances). According to such views which rest on the philosophy of determinism and its effect on the freedom of will, the social framework and social relations as a whole at the time of production will determine what the result will be; no allowances for the designers' personal input are granted.

On the other hand, another popular misconception is the one which underestimates the importance of factors and relationships in the social context in which architectural practice takes place. This attitude may lead to two different misunderstandings of the designer's role in society.

Firstly, as we have seen in 2.4, the underrating of social relations and especially personal parameters in the society which is using the forms, reinforces the belief that the environment determines people's experience and behaviour. And, secondly, the element of artistic creation, which is

involved in the production-synthesis of environmental forms is stretched to its extremes. Not surprisingly, this mystification of the designer's job is often found floating in the air in institutes of architectural education which, inevitably, have to work on reconstructions of reality rather than to deal with real social relations in their practice. Once graduates who have undergone such an experience go out in practice and face the "hard facts of life", it is likely that they become disillusioned and switch to the first attitude discussed above.

As far as the question of the designer's freedom of will is concerned, the discussion of the internal factor in 1.2.4 suggests that no matter how rigid and restricting the limitations are, there will always be a level of some significance at which the designer may express himself through his work. This partial freedom varies with the nature of production of environment, the particular configuration of social relations which form the context it occurs in and the relation the designer has established with this context.

What has been discussed in this study broadens the designer's scope within the framework of this relative freedom.

Environmental forms do not only function in respect to the primary need that initiated their production but they also come in relation to man's cognitive needs in view of his intellectual development. Such a redefinition of the function of the built environment also leads to a redefinition of the designer's role. Therefore, along with the traditional view that this role lies in as much as designers

can design environment, the primary and secondary functions of which satisfies a composite need, the above can be seen operating at another level, as far as the image of environment is concerned. Designers are in charge of the manipulation of objectivations of social relations in the environment. This, of course, is liable to the limitations of the context the designer finds himself in, as this has been discussed above. Nevertheless, the significance of this second level the designer operates at is remarkable in its own right; as such, it is incomparable to the solution of the purely architectural problem.

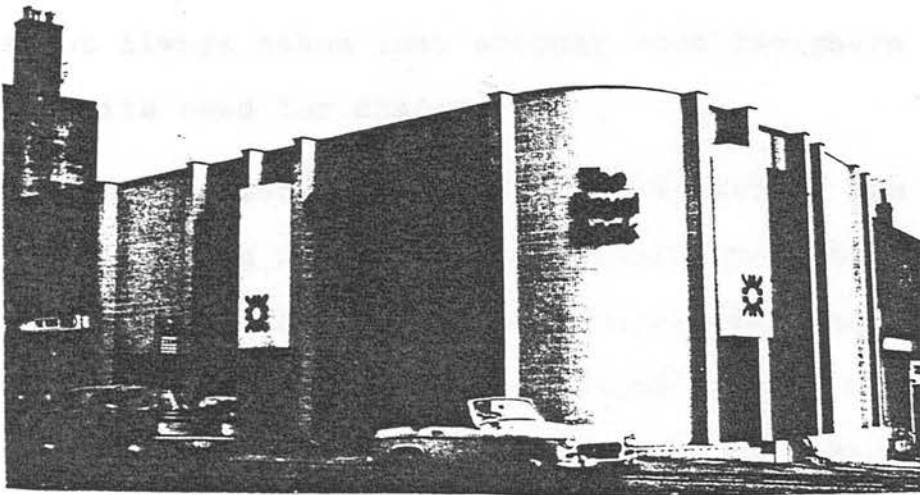
To give an illustration of the duality in the designer's social role, and especially of the second level at which he operates, let us for a moment consider the building of a bank's branch in a city suburb. Naturally, where the building will be situated is a matter of social and economic relations which are typical of the context the designer operates in and are beyond his reach. Furthermore, in as much as the building's elevation is concerned, it is expected that the client may wish the branch to radiate the bank's status and, perhaps, even add to it (1.2.4 and 1.3; see also "semiology-action" in de Ventos, 1980, pp. 194-8). The client's budget, values and preferences will further define the context in which the designer will operate.

Up to this point, it appears that "the architect is a technician who does what is asked of him by his clients" as it has been put by Crosby (Crosby, 1965).

Nevertheless, the architect is normally left with a number

of alternative solutions which would be capable to satisfy the client. In other words, in dealing with structural, functional and decorative aspects of the project, he should be expected to be able to manipulate the amount and nature of potential signifiers in the building's elevation in a number of ways and still be within the limits set by the client. Naturally, any one of such implementations will tend to be experienced differently by people (Fig. 84). The analysis of the users' personal parameters will blend with the designer's intentions to determine what social relations will finally be objectivated. It is natural to expect that some of these may potentially result in distinctly separate group images and still be within the limits set by the bank. It appears that, although the designer's freedom is restricted significantly by the context he operates in, the fact that the environment he creates also functions through its image broadens his role in society to a considerable degree.

It is not necessary to go deep into Sartre's thought to realize that the freedom and broadened social role which the designer enjoys is automatically paired with increased responsibility. And, although the designer's responsibility in as much as the primary function of the built environment is concerned can be easily realized, this is not always so when one thinks of man's cognitive needs. The discussion in 3.2.1 suggested that not all designers have a full conception of their responsibility, especially with regard to the role of the built environment as a domain through



It may be expected that the above neat designs of banks in Corstorphine, Edinburgh, have a different perceptual impact on people while, presumably, they are both restricted by the clients requirements.

FIGURE 84

which man attains his knowledge of the world. The realization of the fact that man may have cognitive needs, which transcend the scope of the activity he is engaged in at the time and which may force cognition to refer to any social relation in the environment's potential informational content, is not always taken into account when designers identify the composite need for change.

But, as has been shown, "all objectivations are susceptible of utilization as signs, even though they were not originally produced with this intention" (Berger and Luckmann, 1967, p. 50). The discussion in the second part of this study suggested that, when the social relations, which are involved in the production of environment, are objectivated (as f.i. denotational meanings of primary functions), then it is more likely that their experience will result in relatively shared public images, provided that the conditions of production are, to some extent, known (see also 3.2.2). When the designer does not realize this, as well as the significance of cognitive experience for man, it is inevitable that he will not take it into consideration. The consequence is a "hyposignificant" environment in which very little is to be deciphered (Choay, 1969, p. 131). The lack of meaning which leads to the dissatisfaction of man's cognitive needs and which may even result in a certain stagnation of his cognitive structures, is accentuated further by the relative importance that informative aspects of reality have acquired in our society (Debord, 1971; de Ventos, 1980, pp. 186-190).

Admittedly, one ought not to blame (at least, primarily) the designers for the failure to produce a meaningful environment. When one accepts the view that in the environmental game there is no "architect alone" but always an "architect within a social context", one can not suddenly forget the effect of the context; especially so, when several crucial factors which restrict the designer's work are clearly beyond his reach. If we let modern cities to serve as paradigms, one may argue that it is the profit-orientated type of society that has led to the production of such "visually fragmented" environments. In this sense, however "good-natured" or, possibly, "well-off" a single designer may be he can not do much to change the scene. In view of the above, one is led to believe that the responsibility over the shaping of environment is to be attributed to both individual designers and the context in which they operate. As the designer's freedom of will is functioning within certain limits, his responsibility over the end product follows similar lines.

As far as the broadened scope of the designer's profession is concerned, it is evident that there is a need for designers to be properly equipped to meet the rising demands. This inevitably incorporates a substantial enhancement of the background knowledge of the man-environment relationship. Based on the discussion in 3.2, the immediate implications of this, in as much as cognitive experience is concerned, can be summarised as follows:

- a. The designer is required to attain a deep understanding

of the nature of man's cognitive experience of man-made environment and the way it relates to man's cognitive needs, which may transcend the scope of goal-oriented behaviour, and to the process of the developement of his mental world.

- b. He is further required to be able to come to some conclusions as regards the people who will use the particular environments he designs. This involves an inquiry into people's personal parameters in cognitive experience, the form their cognitive needs may be expected to attain and so on.
- c. He is to be fully aware of his role as a channel through which social relations become represented in the environment as well as of his position as a manipulator of meaning. Along with this, the understanding of the requirements which will ensure the smooth transmission of potential information is needed (f.i. clarity and legibility, complexity and variety, novelty, known codes and so on).
- d. Finally, in every particular problematic situation, the designer is to be aware of the social relations involved, those of them he needs to objectivate and the dynamics of the potential informational content of the final solution.

It appears that the issue can not be covered with blueprints of remedies or guidelines. Such an attitude, which has been in effect in the past, generally attacks parts of the problem as it lacks an overall understanding. In addition

to this, the issue of man's cognitive experience of the environment is as complex as the "object" of architectural intervention itself, i.e. people and social relations, and can not be readily rubricized (to use Maslow's term). An important initial step in the direction of the broader understanding appears to be the distinction between operational and non-operational cognition. Apart from safeguarding against misinterpretations of the functionalist principles, this distinction places the emphasis back onto the users of environment and their needs.

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